

**SPECIAL EFFECTS, CGI AND UNCANNY AFFECT:
ENVISIONING THE POST-CINEMATIC UNCANNY**

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**SPECIAL EFFECTS, CGI AND UNCANNY AFFECT:
ENVISIONING THE POST-CINEMATIC UNCANNY**

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Keywords:

post-cinematic, uncanny, visual effects, visual arts, animation, affect, computer-generated imagery

Abstract

This thesis presents and discusses the author's practice-based artistic research. It situates the work, an investigation into the post-cinematic uncanny and the affective potential of visual effects technologies in art practice, within a theoretical context and aims to illuminate aspects of our relationship to certain types of digitally augmented contemporary moving imagery.

The practice explores the post-cinematic uncanny as an intersection of visual arts, moving image, animation, cinema, television and visual effects, linking it to theories of psychoanalysis, affect and post-cinema. It questions the nature and qualities of moving image in the 21st century, especially the pervasive and ubiquitous nature of computer-generated imagery (CGI) that supplements and augments digitally captured footage. In doing so it creates, explores and situates the post-cinematic uncanny within contemporary arts practice. The work employs technologies that were, until relatively recently, the preserve of high-end visual effects productions and aims to engender uncanny affect in its audience. It thus falls under the purview of Steven Shaviro's speculations on post-cinematic affect (2010). This 'post-cinematic' refers to the transformation of moving image practice and culture, driven in part by the move to digital acquisition, manipulation, distribution, display and networked consumption. It provides a conceptual framework for this practice in relation to the wider context of cinema and moving image production.

In the practice, visual effects technologies have been employed site-specifically to create the impression of things unknown yet familiar, occupying a liminal zone between biomorphic and mechanical form and patterned on human-designed objects and environments. These reside in the screen-space, creating new associations, fantastic implied narratives and extra-dimensional

implications in otherwise mundane spaces. Disconnected from the profilmic event, these computer-generated images may be 'perceptually realistic but referentially unreal' (Prince, 2002:124) and yet have no connection to the profilmic beyond an urge towards the 'paradox of perceptual realism' (Rodowick, 2007:101). In this respect, CGI visual effects imagery may be analogous to Freud's uncanny double (1919).

CHAPTER ONE: LITERATURE & PRACTICE REVIEW

Introduction

I have a background as a fine art practitioner but now lecture predominantly in the fields of design, illustration and animation. Initially working with painting, video and installation, I have become increasingly interested in digital moving imagery and especially three-dimensional computer generated imagery. One starting point for this research was a very short experimental video/animation composite called *5th Floor*, made in 2010 (fig. 16). This piece marks my first use of a visual effects technology called 3D tracking (or matchmoving) to perceptually anchor the computer-generated image into the screen space of a moving camera shot. This process is highly technical yet produces seemingly magical results. Even as the creator of the piece, in full possession of its secrets, I found that I was simultaneously absorbed, delighted and troubled by its illusionistic effect and the relationship between this computer generated 'sculpture' and its environment. The impetus behind this research is to discover why this fascinated me, how it operates in relation to the audience and what its further potential is in art practice. The research presented in this thesis thus develops the use and exploration of visual effects technologies through artistic practice-based research. The work and its associated writing explore the particular uncanny qualities of visual effects in 21st century moving image. The uncanny encompasses a wide range of phenomena, and can initially be defined here as a disquieting sensation of unease provoked by something strange, yet also ultimately familiar that occurs, according to Freud, '...either when infantile complexes which have been repressed are once more revived by some impression, or when more primitive beliefs which have been surmounted seem once more to be confirmed' (1919:17). Gunning summarises this eloquently; 'For Freud, the uncanny signals the emergence of unconscious material from repression, and it can take many forms' (2003:47). This model of repression and return, mediated by the uncanny, has since been developed and applied in a variety of theoretical and cultural contexts.

The spectacle of twentieth century cinematic special effects is shown to lead to the relative ubiquity and invisibility of contemporary post-cinematic digital visual effects, which re-emerge in the practice as uncanny visitors to physical environments. The theoretical framework for and development of the practice links affect theory, the Freudian (and Jentschian) uncanny and historical/archaeological approaches to post-cinematic media in a novel way.

Research Aims

This research aims to discover how contemporary, post-cinematic visual effects, which are pervasive and ubiquitous in much of the moving imagery that we consume, can be brought into revealing and powerful new relationships with art audiences. It proposes that this might be approached and mediated through the affective phenomenon of the uncanny. Further to this, the research may impact on our perception of the wider field of post-cinematic imagery that permeates global cultures. In characterising this practice as the 'post-cinematic uncanny' I aim to define a form of uncanny experience, particular to current developments in moving imagery, created by bringing this familiar and ubiquitous CGI imagery into new relationships with the audience.

Methodologies

The primary methodology in this project is of research through artistic practice. Various (and confusingly) called practice-based, practice-led, artistic research, practice as research, the commonality is in their '...use [of] the arts as instruments of enquiry.' (Sullivan, 2010:55). Artistic research embraces the particular ways of knowing (McNiff, 2013) that can be produced by creating, engaging with, reflecting upon and disseminating artwork. Here 'PaR [Practice as Research] involves a research project in which practice is a key method of inquiry and where...a practice...is submitted as substantial evidence of a research inquiry' (Nelson, 2013:9). Artistic research allows for the inclusion of *practical* and *embodied* knowledge within the context of higher level research (Nelson, 2013:56-57). These kinds of knowledge can be experienced and known through practice and may also be alluded to in the complementary writing for the research. My proposition is that the type of affective experience that I am researching here is

best explored and communicated by artistic practice. In turn, this thesis illuminates the practice and supports its development.

The practice presented is cross-disciplinary in its nature; visual effects are usually designed and produced by teams of creatives and technicians but here all of these roles, from camera operator, modeller, technical director, animator, compositor and sound designer, have been performed by me. Further to this, these visual effects have been presented outside of their normal context, employing conventions of installation art. Artistically, the practice has been influenced by a diverse range of painters, sculptors, installation and media artists, whilst creatively and thematically I have also been immersed in the cosmic horror of H.P. Lovecraft's stories and the pessimistic science-fiction of Stanislaw Lem. The theoretical framework for this cross-disciplinary practice must therefore work within and cross between the fields of film studies, visual culture, psychoanalysis, animation studies, affect theory, media history and media archaeology.

Although the practice can be understood as a kind of visualisation or illustration of the theoretical models presented in this thesis, this would be a simplification of the approach. The research process forms a complex network that connects the practice and its theoretical framework. The practice has been produced through an experimental and iterative process where the developing work has been exhibited at early stages of the research and repeatedly thereafter. Exhibition has not been a summative endpoint but a key stage of reflection and development. Throughout this process the developing theoretical framework has both informed and been informed by the development of the practice. The goal has been to work with these media theories in practice but not necessarily to directly illustrate the theoretical framework for the audience.

Special effects and spectacular CGI



Fig 1. Jurassic Park



Fig.2 Terminator 2

The practice presented in this thesis makes extensive use of digital visual effects technologies. To understand this, it is necessary to distinguish early CGI based visual effects of the 1990s, which were initially greeted with astonishment and wonder, from the more familiar, yet subtle and technologically mature interventions that pervade contemporary moving imagery. Computer-generated visual effects in late 20th century cinema were a marvellous technological novelty. For many Hollywood films these effects were central to attracting paying audiences. Of course, at that time, the only way to really see these effects was on an actual cinema screen – VHS video at what is now called ‘standard definition’ was an inadequate second best. Films like *Jurassic Park* (1993) or *Terminator 2* (1991) became, to use Tom Gunning’s coinage, part of a later ‘cinema of attractions’ (1990). Audiences were paying to see these films because of the spectacular special effects, at least as much as for their film stars, plot, narrative, performance or characterisation. For this reason, the cinematic visual effects in these movies were pulled in two directions at once; towards invisibility, photorealism and perceptual plausibility – acting in

the service of the narrative - and also simultaneously the need to be noticed, to dominate the screen, draw attention and create awe (Ndalianis, 2005: Pierson, 1999). For these visual effects ‘...it is their separateness, their slight incongruity, that makes them special.’ (North et al 2015:4).

Visual effects and CGI in 21st century cinema



Fig. 3 Lexhag (2015) Poldark visual effects breakdown

Today, something appears to have changed. The technology, as it always does, has moved on and we may think that our visual effects are now more realistic (they certainly *look* different in some ways). Computer-generated imagery, spatially composited into live action footage, has become a commonplace; ubiquitous and pervasive. Advanced visual effects are now frequently used in television dramas and low budget productions. Rather than being awed by special effects, we may not even be aware of their presence. In fact, noticing a visual effect within a shot can now be seen as a sign of its failure, so these types of effect are familiar, yet go mostly unobserved and unnoticed. We see examples of them every day and accept this as part of the process, or ‘affective labour’ (Shaviro, 2010:47-50) of consuming moving imagery. In the example presented above (fig.3) from the BBC historical drama Poldark (2015), the post-production studio Lexhag have digitally reconstructed a ruined Cornish tin mine. This effect is not intended to impress or draw attention. Very few viewers of the programme would likely

give any consideration to whether visual effects were used in the programme. It seems even less likely still that anyone would watch the programme *because* of its visual effects.

As Gunning observes, 'The most common trick performed by optical effects today is literally causing themselves to become invisible, unnoticed, - to disappear' (2008:82). While it becomes ever easier to agree that many special effects pass unnoticed, it does also seem that, in the right context, the uncanny qualities of the most prosaic effect can be brought to the forefront of the viewer's experience. This can highlight the peculiar nature of these familiar, yet forgotten and unseen images that we encounter so often. The mechanism by which technological novelty becomes ubiquitous and unremarkable, yet may later be renewed in cultural experience is outlined by Tom Gunning (2003). Gunning explores historical '...periods of cultural wonder...' (2003:42) and shows how the wonder at novel technologies soon fades into the banality of the everyday, habituation and ultimately automatism. Within the framework of the cultural '...rhetoric of newness...' (2003:43) disenchantment and habitualisation, the eventual outcome of which is '...to render us unconscious of our experience', he asks; 'Once understood, does technology ever recover something of its original strangeness?' (2003:45). This recovery is the 're-newing' of the essay's title (2003), which, he suggests, occurs periodically through art and fiction. Gunning proposes the *uncanny* as the mechanism by which this re-newing occurs. It is '...another term to mediate between the extremes of astonishment and automatism...which seems to permeate the whole cycle...' (2003:46). The reception of the new in society and technological novelty in particular is paradoxical; contained within and yet simultaneously excluded from the idea of novelty is the anticipation of its inevitable ubiquity, familiarity, boredom and even contempt. Gunning proposes a kind of Freudian dialectical interaction, a cycle of novelty and familiarity. The fears and anxieties that come with the emergence new technologies are repressed but a sudden breakdown of this 'psychic buffer zone' (2003:43) can lead to the return of the repressed material. So, wonder at novelty is a particularly modern form of social discourse; 'The discourse of modernity, then, is not only one of innovation, but precisely one of novelty, maximising the dazzling experience of the new.' (2003: 43). After the initiation of this cycle through the introduction of novel technologies 'Inattention can be

transformed into wonder; wonder can be worn down into habit; habit can suddenly, even catastrophically, transform back into a shock of recognition.’ (2003:46). According to Gunning, there are two main mechanisms by which technologies may be re-newed. Firstly, through artistic strategies of formal play, shock and defamiliarisation and secondly by becoming conspicuous through breakdown, failure and ceasing to function. Both are permeated by the uncanny (2003:46). Gunning states:

In other words, new technologies evoke not only a short-lived wonder based on unfamiliarity which greater and constant exposure will overcome, but also a possibly less dramatic but more enduring sense of the uncanny, a feeling that they involve magical operations which greater familiarity or habituation might cover over, but not totally destroy. It crouches there beneath a rational cover, ready to spring out again. (2003:47)

Gunning’s ideas put Pierson’s characterisation of the period 1989-95 as ‘The Wonder Years’ of effects-driven science fiction cinema that ‘...put the display of the digital artefact – or computer-generated image – at the centre of the entertainment experience’ (1999:158) into a new context as part of a cycle of wonder, disenchantment and rediscovery or ‘re-newing’, mediated by the uncanny. The renewal of already-present uncanny anxieties in the ‘magical operations’ (2003:47) of established visual effects technologies is a key method employed in the practice presented here. This is also found in the content of the work, their sculptural animated characters suggesting animist beliefs that rational thought rejects. In this way the artwork forms part of the cycle from novelty, spectacle and wonder to ubiquitous invisibility to re-newed uncanny spectacle.

As well as their visual qualities, I would also argue that the way computer-generated visual effects technologies are used has changed. CGI based visual effects are increasingly being employed in a way that comes much closer to the ideal of the ‘invisible art form’ that movie special effects always claimed to be (Manovich, 2001). What I am suggesting is not simply that

the technology has developed but also that the purpose and intention behind the creation and consumption of these effects has changed in some way. Additionally, the clear distinction between visual effects and cinematography, production and post-production is becoming blurred in the accelerating 'visual effects-isation' that impacts every part of the filmmaking process (North, 2015:273). CGI visual effects are no longer the sole preserve of big budget cinematic productions and cinema, as Steven Shaviro notes (2010), is no longer the dominant art form of our century.

The post-cinematic

Steven Shaviro (2010) coined the term 'post-cinematic' in reference to the current landscape of moving image practice and culture that has been transformed by the move to digital acquisition, manipulation, distribution, display and networked consumption where 'Digital technologies, together with neoliberal economic relations, have given birth to radically new ways of manufacturing and articulating lived experience' (2010:2). This provides a framework that allows the conceptualisation of the research practice in relation to the wider context of cinema and moving image production. For Shaviro '...filmmaking has been transformed...from an analog process to a heavily digitized one.' (2010:1) leading to the emergence of a '...different media regime, and indeed a different mode of production, than those which dominated the twentieth century.' (2010:2). While the impact of the digital turn in filmmaking is important for Shaviro, the post-cinematic is, however, more than a recognition of changing economics and technologies. Constitutive of social processes rather than simply representing them, post-cinematic media are '...machines for generating affect...' (2010:3). Shaviro employs Massumi's concept of affect (2002) to explain '...a kind of ambient, free-floating sensibility that permeates our society today...' (2010:2). In his examination of film and music video Shaviro moves to map the flows of transnational capital in culture (2010:36), 'the exhaustion of temporality' (2010:87) and the exhaustion of possibilities in a hypermediated aesthetic of accelerationism (2010:131-9)

There has been a range of debate over the change from analogue to digital technology in filmmaking and photography. For example, Shaviro focusses on the ontology of the digitally recorded and manipulated - or as he puts it 'modulated' - data of the moving image in his discussion of Grace Jones' music video 'Corporate Cannibal' (2010). In Rodowick's *Virtual Life of Film* (2007), the ontology and indexicality of the mechanically recorded image, the '...material basis of [its] photography' is discussed at length. Digitally captured and manipulated imagery has a more distant and problematic relationship to the profilmic event since '...computational processes are indifferent to medium and to the referent in a way that conventional cameras cannot be, for film cameras are dedicated to the task of chemical contact with a profilmic event to which the camera is present'. (Rodowick, 2007:121). Digital moving image, on the other hand, is '...a complex, aggregated and digitally coded electronic signal – rather than a 'visual transcription' a 'witnessing or testimony,' as Rodowick characterises the cinematic image...' (Shaviro, 2010:17). The digitally recorded image does have a different ontological status than the analogically captured trace. What is open to question, however, is how much difference does the choice of recording technology make to the audience? This is discussed critically in the context of still photographic imagery by Mitchell (2006).

The question of the *computer-generated* image's place in this debate could yet be more interesting, however. Perhaps these images have a different kind of ontological status and relation to the profilmic event? The ontological status of the profilmic event, or the means of production of an image, does not necessarily have any bearing on its audience's experience, but, in the case of CGI, contemporary audiences are certainly becoming acclimatised to viewing and accepting a fundamentally different *kind* of image. In this artistic research practice one of the things I have been attempting is to bring the peculiar status of these computer generated moving images to the foreground.

Manovich argues that, by layering and compositing, digital media takes montage, which was conceived of primarily in terms of temporality by Eisenstein, into a new kind of spatial montage. He goes on to describe '...ontological montage: the coexistence of ontologically incompatible

elements within the same time and space.’ (2001:159). This ontological montage may be connected with the ontological uncertainty that for Ernst Jentsch characterised the uncanny (1906). Ontological uncertainty is a key feature of uncanny experience and occurs in this artistic practice when the techniques of visual effects are brought to the forefront of experience as opposed to being hidden ‘...invisible effects...’ of ‘...simulated film language...’ (Manovich, 2001:309).

For the purposes of this research I locate contemporary visual effects within the field of the ‘post-cinematic’ (Shaviro:2010). Post-cinematic visual effects are now familiar, technologically mature, capable of great subtlety and frequently go unnoticed in practice, yet are transformative and pervasive. Post-cinematic effects exist on television, in games and on mobile devices as much as they do on the cinema screen. The distinction between cinema and other screen-media in the post-cinematic period is smeared and blurred. Post-cinematic visual effects are distinct from effects that draw attention to themselves as a central feature or attraction of a media production. They are no longer novel and, although they may be spectacular in intent, they do not need to draw attention to themselves. The post-cinematic uncanny therefore refers to uncanny qualities lurking repressed within post-cinematic moving imagery.

Animated imagery and the illusion of life

Animation is an unusual kind of magic trick, as in Gunning’s example of a flip-book (2013), that we can always play on ourselves, whether or not we know the secret of how it works. At the heart of animation and all moving imagery lies an enchantment: ‘..the illusion of motion given to individual still images constitutes the core illusion of cinema, its ultimate magic trick’ (Gunning, 2008:84). In animation, the familiar still drawing returns by repetition, subtle change and the persistence of vision as something astonishing. Further, in an inversion of the usual hierarchy, one could argue as Manovich does (2001), that cinema is in fact a subcategory of animation. Animation relies on perceptual phenomena that we are not consciously aware of to

create 'the illusion of life' (Thomas and Johnson, 1995). If one begins to think of this trick as uncanny this quality spreads and pervades the moving imagery that we take for granted.

Animation is pervasive in contemporary moving image culture. It is transforming cinema, is the basis for computer games, is used throughout the web, and advertising and propaganda learned early on of its power to astonish, influence and coerce...Especially since the digital shift, animation is implemented in many ways in many disciplines and on multiple platforms. (Buchan, 2013:1)

Animation is an essential element of the practice presented in this thesis. The hybrid status of the final moving imagery – combining visual effects, animation, video installation and sculpture – means that it must be included in the discussion and analysis. The computer animations within the practice are produced using both keyframes and dynamic simulations. In the 'hand animated' movement, animated parts are individually keyframed at different times through the project and then finessed via function curves to allow for changes in speed over time. (figs. 50 and 51) This process is analogous to that used in drawn animation where keyframes or key poses are drawn first and the intermediate frames are interpolated in a process called inbetweening. Dynamically simulated animations are calculated by software according to models of real-world physical forces and processes from initial starting conditions that are set up by the user. Much of the practice so far uses a combination of both approaches. However, for a variety of reasons, the audience for the work may not consider the practice as being within the field of animation.

Animation has always been an important, if often under-acknowledged, element of visual effects production in film and television. Many practical visual effects shots, such as the robot skeleton in *The Terminator* (1984), or the racing mine carts in *Indiana Jones and Temple of Doom* (1984), were produced by a process of stop-motion animation. This process was not intended to be conspicuous and the sequences were not presented as animated interludes within the films; great efforts were made to ensure that they maintained an impression of

continuity with the rest of the production despite having being produced in a radically different way. The input of animators into the production of visual effects tends to be downplayed, as in, for example, the crucial role animators play in the manipulation and refinement of raw motion capture data generated from the performance of actors. An example of this can be found in the production of animated characters such as Gollum in 'The Lord of the Rings: The Two Towers' (2002) and the giant ape in 'King Kong' (2005), whose movement was based on motion capture data from Andy Serkis' actions, but made into a convincing performance by the character within the context of the film by teams of animators (Gunning, 2006). We have reached the stage where some apparently 'live-action' films may contain such a large amount of animated content that the distinction between live action and animated films is now unclear (Wells, 2002a:3). Animation, in common with visual effects production, has been described as an 'invisible art' (Wells, 2002a:5-7). The practice of animation within the context of visual effects production is therefore doubly-invisible

Animation production in general has tended to be a poorly understood process compared to television and filmmaking. For many people, animation is synonymous with Disney Studios cel animation, and to a lesser extent computer generated and stop motion animations. There is a strong association between animation and children's entertainment (Wells, 2002a:1). There is also a perceived hierarchy and opposition in moving image, with narrative cinema often being seen as having a higher 'seriousness', priority and importance than animated productions (Skoller, 2013:225), and a further, nested hierarchy within animated productions where '...recognition of Disney's achievement was to create a hierarchical effect in the field which inevitably demoted the significance of other forms' (Wells, 2002b:2)

The recent historical and media-archaeological re-evaluation of moving image practice and culture has led to a broadening and deepening of what can be considered within the history of cinema and moving image. Additionally, the increasing prominence and attention paid to the part played by animation in computer-generated imagery, visual effects and postproduction is leading to greater academic interest in animation. For example, Tom Gunning describes a

recent ‘...Copernican revolution in attitudes towards animation’ (2013:52), exemplified by Manovich’s category inversion of animation and film (2001). In thinking of animation as a discrete medium within the wider context of moving image and cinema, a similar subdivision of the field into classical or commercial animation and alternative or experimental animation (Wells, 2006) is commonplace, but insufficient to describe the range and scope of animation within 21st century visual culture. Gunning is highly critical of the suppression of animation within mainstream film theory:

‘...it has always seemed to me extraordinary – if not scandalous – that most traditional, photography-based film theory simply ignored the realm of animation, as if it were a childish aspect of film, unworthy of serious consideration. The new cinema of special effects forces us to redress this imbalance – less because of an actual transformation in cinema itself than because of the increasingly visible role post-production special effects play in the Hollywood Blockbuster...’ (Gunning, 2006: 322)

With regards Gunning’s critique, it is interesting to note that even a relatively recent text, such as Mullarkey’s *Refractions of Reality: Philosophy and the Moving Image* (2009) does not have a chapter or even an entry in the index on the subject of animation.

Lev Manovich, in his influential book ‘*The Language of New Media*’ (2001), argues for a re-evaluation of the relationship between animation and cinema, which results in an inversion of the accepted hierarchy. He states that ‘Digital cinema is a particular case of animation that uses live-action footage as one of its many elements’ (2001:302). Gunning explains this inverted relationship as follows: ‘Approaching motion photography as a subgenre of animation makes the intimate relation between the production of motion and magical effect more than a sideshow in film history.’ (2013:66)

Manovich also argues that there has been a kind of suppression or repression of animation even within the category of cinema.

‘Once the cinema was stabilised as a technology, it cut all references to its origins in artifice. Everything that characterised moving pictures before the twentieth century – the manual construction of images, loop actions, the discrete nature of space and movement – was delegated to cinema’s bastard relative, its supplement and shadow – animation. Twentieth century animation became a depository for nineteenth century moving-image techniques left behind by cinema’ (2001:298)

Manovich proposes that while the cinema continued to employ methods such as ‘...models, mirrors, and matte paintings...combined with other images through optical printing’ it still ‘...pretends to be a simple recording of an already existing reality – both to the viewer and itself’ (2001:299). While animation frequently exposed and explored the means of its own production, the cinema mostly laboured to keep its artificiality hidden. To apply this characterisation of 20th century moving image and animation to Freud’s conception of the uncanny, one might suggest that a cinema defined itself by a process of repression. This repressed material resurfaces first as animation and more recently in the new processes of digital cinema, ‘... with the shift to computer media, these marginalised techniques moved to the centre.’ (2001:300). Digitally composited and edited moving imagery has ‘...a plasticity that was previously only possible in painting or animation’ (2001:301). While retaining the formal language and surface resemblances of cinema, the advent of digital postproduction with its early emphasis on the fantastic unavoidably foregrounded the artificial status of its own methods.

Zielinski suggests an expanded field or ‘phylum’ of animation that includes ‘...living apparatuses or machines mimicking life functions...’. Here we find a ‘world full of bachelor machines and mechanical brides...dolls and dummies, mannequins, masters with marionettes and shadow puppeteers, masques and travesty.’ (2013:28). This further expansion of animation to include puppetry, devices and techniques that do not rely on the phenomenon of the persistence of vision is enlightening and interesting, but risks broadening the category to point that its use-

value is limited. In including automata, telematic muscular stimulation and magic lantern shows within the field of animation, Zielinski shows that ...animism may lie at the very root of animation' (de Solla Price, 1964, cited in Zielinski, 2013:30). The concept of animism or 'The illusion of life' (Thomas and Johnson, 1995) is crucial in most studies of animation. This impression of liveliness can be seen as part of animation's appeal yet also reflects our tendency towards '...animism and the superannuated workings of our mental apparatus' (Freud, 1919:150). While we may not actively believe in the literal life of these moving images, we are none the less deeply engaged in a way that belies our consciously stated beliefs about them. We have, as Mitchell puts it, a 'double consciousness' (2005:11) when it comes to the life and status of images in general and, arguably, animated images in particular. So, 'Far from being defanged in the modern era, images are one of the last bastions of magical thinking...' (2005:128). Mitchell develops the concept of a 'metapicture' (2006), to refer to a picture that reappears recursively within itself (a *mise en abyme*) or whose content reflects on its nature as a picture – a picture that is in some way about being a picture. He goes on to connect the metapicture to the uncanny potentiality of images:

The metapicture, then, is also a figure that helps to explain the often-observed uncanniness of images, their ghostliness or spectrality, their tendency to look back at the beholder, or seemingly to respond to the presence of the beholder, to "want something" from the beholder. (Mitchell, 2006)

By discussing animism, magical desiring images, moving dolls, puppets and automata, the reanimation of the dead by the application of electricity and artists such as Cindy Sherman and Hans Bellmer, Zielinski and Mitchell lead the discussion of animation onto the phenomenon of the uncanny.

The uncanny

Visual effects for cinema, in contrast to their scientific and technological means of production, have historically tended to be employed to show spectral, fantastic, ghostly and impossible

things on screen. For this reason, visual effects have a longstanding connection with the uncanny in terms of their content and the narrative purposes to which they are put (Ndalianis, 2005). On showing my early practice such as *5th Floor* (fig. 16), which does not have overtly ghostly or supernatural subject matter, I noticed a range of reactions that tended towards the physical, exclamatory and gesticular. Although the word uncanny was not initially used, there was clearly something unsettling and disquieting about it, especially for those people were familiar with the shot's original location. This implied that there might be something uncanny in the technological process of 3D tracking itself. The practice, as it has developed, has become more deliberately uncanny in its content, but with the intention to reinforce and amplify the technological uncanny in its methods. In order to relate the post-cinematic to this phenomenon it is necessary to develop the definition and understanding of the uncanny here.

The concept of the uncanny has primarily been developed through psychoanalysis. Psychoanalysis and cinema (both in its criticism and production) have a longstanding connection. Although he did not invent the concept of the unconscious, '...it was Freud's implementation of the unconscious that made the concept all-pervasive. And, emerging as it did at the same time as cinema, it was inevitable that the two would become closely linked' (Mullarkey, 2009:62). Mullarkey also suggests that the 'general melodramatic structure' (2009:62) of Freudian theory means that cinema lends itself especially to Freudian analysis. Given Freud's key role in developing theories of the uncanny (1919) it is inevitable that psychoanalytic theory should be brought into play in this research.

The English word 'uncanny' is roughly equivalent to the German word 'unheimlich', which translates as 'unhomely'. This is something that, rather than being familiar, comforting and comfortable is unsettling, unfamiliar and disquieting. For 'someone to whom something 'uncanny' happens is not quite 'at home' or 'at ease' in the situation concerned' (Jentsch, 1906:217). Other English words that come close to the meaning of unheimlich are eerie, eldritch, spooky, mysterious and strange. Although they are not precisely the same, there is a substantial crossover between creepiness and the uncanny (Kotsko, 2015). Horror is not the

same as the uncanny, although the uncanny may increase the feeling of horror. For example, scenes of war and death may be horrific but are not necessarily uncanny. The art practice presented in this thesis deals with both the uncanny qualities inherent in the technologies used as well as an increasingly uncanny subject matter and mode of presentation. The methods and technologies used are now commonplace and unremarkable and so familiar (if not necessarily well understood) by their audience. As shown later, the presentation of familiar visual effects in new spatial configurations or in the context of urban, industrial or domestic settings, forces its audience into a re-newed (Gunning, 2003) relationship with the technology and the exhibition space.

Ernst Jentsch wrote his essay 'On the Psychology of the Uncanny' in 1906. It is referred to by Freud in his later essay (1919). Jentsch's main argument is that the sensation of the uncanny is primarily aroused due to 'psychical uncertainty' (Jentsch, 1906:220). Here the uncanny is a feeling, a '*lack of orientation*' (1906:217), that arises from the when something is 'uncertain or undecidable' (Sellars, 1995:216) such as "...doubts whether an apparently animate being is really alive; or conversely, whether a lifeless object might not be in fact animate" (Jentsch, 1906:221). Jentsch describes many exemplar uncanny phenomena such as the dead tree trunk that turns out to be a live snake (1906:221), 'wax figures, panopticons and panoramas' (1906:222) and, in the case of automata, briefly mentions the fiction of E.T.A. Hoffmann (1906:224), which Freud would go on to explore in much more detail. This psychical uncertainty, undecidability or indeterminacy links closely to the later discussion of the ontological status of different kinds of imagery and the ontological uncertainty provoked by illusions and visual effects.

The term 'uncanny valley', coined by roboticist Masahiro Mori (1970), is closely connected to Jentschian notions of the uncanny. It is a concept that applies to any 'entity' such as a puppet, robot or dummy, and is not necessarily connected to the digital or post-cinematic. Here, a double that very closely resembles, yet is subtly unlike a real person is more disturbing than one that is clearly stylised or artificial. The uncanny valley is a widely-used term within

academia and popular culture, especially since the development of the 'digital double' in cinema and use of motion capture in animation. The theory explains something of our relationships with humanoid, anthropomorphic characters and objects. It relates to Freud's concept of the uncanny double (1919) and also clearly to Jentsch's 'psychical uncertainty' (1906:220). This particular type of ontological uncertainty is certainly a powerful phenomenon and has increasing relevance and impact given the current rapid development of artificial intelligence, robotics, CGI and real-time graphics. The uncanny valley is now the type of uncanny experience most closely associated with computer graphics. It is, however, not central to this research, and should be distinguished from the affective phenomenon of the post-cinematic uncanny that is being developed here.

There is a sense in Freud's later essay, 'The Uncanny' (1919), that he finds Jentsch's explanation of the uncanny not simply incomplete, but insufficient, or even 'unacceptable' (Sellars, 1995:216). Freud wanted a better explanation of this powerful phenomenon that fitted more clearly within his psychoanalytic theory.

'Freud indicated that Ernst Jentsch's slightly earlier description of the uncanny remained inadequate, because the intellectual uncertainty with which Jentsch identified the term offered too broad a territory and could not explain the affective quality of the experience of the uncanny which Freud, in his classic essay, tried to do' (Gunning, 2008:69)

The Freudian uncanny is the return of something that was repressed (and thus familiar) in unfamiliar form (1919). The sense of familiarity is an important component of the uncanny that distinguishes it from horror, creepiness or the utterly alien. Freud suggests that this process of repression and return is the uncanny's distinguishing characteristic.

‘Freud was perhaps the first to foreground the distinctive nature of the uncanny as a feeling of something not simply weird or mysterious but, more specifically, as something strangely familiar’ (Royle, 2003:vii).

The repressed material may be, for example, the original relationship to the mother’s womb and genitalia, pre-modern ways of thinking about causality and coincidence, supernatural action at a distance, or early fears in Freudian theory such as castration anxiety. In these cases, as in that of the double, ‘...the other forms of disturbance in the ego...are a harking-back to particular phases in the evolution of the self-regarding feeling, a regression to a time when the ego was not yet sharply differentiated from the external world and from other persons.’ (1919:10)

Like many writers on the uncanny, Freud produces a list or typology of uncanny things which is extensive although by no means exhaustive. He then attempts to fit it into a psychoanalytical framework. The essay focuses extensively on the fiction of E.T.A Hoffman, and in particular *The Sandman* (1817). Freud moves freely between anecdotal descriptions, case histories of patients and the analysis of fictional texts. One of the interesting aspects of Freud’s essay is that, although he makes the phenomenon of the uncanny fit his theories of the unconscious mind, one still gets the feeling that there is something unsatisfactory or incomplete about his explanation. For example, in the proposition that ‘...feet which dance by themselves...’ are uncanny through an ‘...association with the castration-complex’. Although this fits within Freudian theory, the writing is somehow defensive, as if Freud himself was not altogether sure he had mastered the uncanny. There is a certain irritation and defensiveness (1919:8) in Freud’s essay that may result from critical attacks on his ideas but also might involve his uneasy relationship with the essay’s topic. Creed (2005:8-14) summarises a range of criticisms of Freud’s explanation of the uncanny; for ignoring the feminine uncanny, the uncanny status of the male-mother as progenitor of monsters and automata and the uncanny human/animal hybrid, examples of which can all be found in Freud’s key exemplar text, Hoffman’s *Sandman*. Freud acknowledges that it is unusual for him to venture into the area of aesthetics and the

'remote region' (1919:1) of the uncanny and recognises that it has certain slippery qualities (1919:10).

In terms of the uncanny qualities of mirrors and doubles, it is useful to reflect on Lacan's concept of the mirror stage, the point at which the infant perceives in its mirror image a unified and discrete individual, the double and reflection, who takes the place of Freud's undifferentiated ego (1919:10). The child then assumes '...the armour of an alienating identity, which will mark with its rigid structure the subject's entire mental development' (Lacan, 1977:4). This simultaneous identification with and alienation from one's own image in Lacanian theory further emphasises mirrors, reflections and doubles as the sites of early familiarity and identification and yet also alienation and anxiety. Mirrors and reflections are a later development in the artistic practice (fig. 38-39).

In post-Freudian theory, Slavoj Žižek follows Lacan to argue that the uncanny monster provides an empty surface that enables the emptiness or void at the heart of the subject to be hinted at, something that would be unbearable or impossible to confront directly; '...monsters embody enjoyment qua the limit of interpretation, that is to say, *nonmeaning as such*' (Žižek, 1991:64 italics in original). "Enjoyment" here is used in the Lacanian sense of the horrifying fascination that pertains to the monster itself (1991:64). The uncanny, here in the form of the monstrous, exists as a limit to our symbolic order revealing that: 'In its most radical dimension, the "subject" is *nothing but* this dreaded "void" – in *horror vacui*, the subject simply fears himself, his constitutive void'. (1991:67). In this conception, the uncanny is inherent in our participation with language and the symbolic order.

Mladen Dolar (1991), in emphasising the centrality of the uncanny as a concept, states that the uncanny is '...located at the very core of psychoanalysis', it is a '...clue to the basic project of psychoanalysis' (1991:2). Dolar criticises Freud's essay however, which '...leaves us with only a sketch or a prolegomenon to a theory of the uncanny.' (1991:2). Dolar leads us from a critique of the shortcomings of Freud's *unheimlich* to Lacan's neologism *extimité*.

This term [extimité] aims directly at the essential dimension of psychoanalysis. Putting this simply, one could say that traditional thought consisted of the constant effort to draw a clear line between the interior and the exterior. All the great philosophical conceptual pairs – essence/appearance, mind/body, subject/object, spirit/matter, etc. – can be seen as just so many transcriptions of the division between interiority and exteriority. Now the dimension of extimité blurs this line. It points neither to the interior nor to the exterior, but is located there where the most intimate interiority coincides with the exterior and becomes threatening, provoke horror and anxiety. The extimate is simultaneously the intimate kernel and the foreign body; in a word, it is *unheimlich*' (1991:6).

For Dolar the uncanny is a '...fundamental dimension of modernity...' but also a limit to interpretation.

Just as with Freud's approach to Jentsch's earlier work, this impression that there is something incomplete or unsatisfactory in Freud's theorisations of the uncanny may go some way to explaining the wealth of newer material in the field. Theorists since Freud have further refined and extended our understanding of the uncanny, for example in Vidler's '...spatial uncanny [which is] no longer entirely dependent on the temporal dislocations of suppression and return, or the invisible slippages between a sense of the homely and unhomely, but displayed in the abyssal repetitions of the imaginary void.' (1992:37). Tom Gunning (2008) discusses the 'optical uncanny' in the context of early cinema and modern visual effects. Dylan Trigg explores horror (2014) and the uncanny (2012) through the development of an 'unhuman' phenomenology (2013:5). Barbara Creed describes and develops a primal uncanny, specifically relating to the '...excessive presence...' (2005:xvii) of the male monster in film folklore and mythology, who undermines '...the symbolic order by demonstrating its failures, contradictions and inconsistencies.' (2005:xvi). The persistent return of the uncanny in critical theory, art history, media theory and philosophy demonstrates its importance as a phenomenon and area of

enquiry but perhaps also its resistance to theorisation. One possibility, which I develop later, is that uncanny experience is a form of affect, in the Deleuzian/Massumian sense of the term.

Gunning defines a ‘specifically *modern* uncanny’ (2008:68, italics in original), and discusses its depiction in fantastic fiction and the ‘modern scientific and technological exploration of vision and optics’ (2008:70). He compares the uncanny magical illusion, based on sleight of hand, with modern scientific/optical illusion, which paradoxically ‘can be simultaneously rational in its method and seemingly supernatural in its effect’ (2008:82). Elsewhere (2013), he compares the magician’s ‘blow book’, which relies on the skill, misdirection and dexterity of the performer to the animated flip book, a device operated directly by its audience where ‘...nothing remains hidden.’ (2013:62). This distinction between skilful performative prestidigitation and a more modern kind of magic, based on natural philosophy and the science of perception is helpful in understanding the historical connection between the uncanny, phantasmagoria, early cinema, and visual effects for television and cinema.

Images, moving images and animation, optical technologies, visual effects and CGI all have uncanny potentialities. As I suggested earlier, the type of visual effects employed in the practice is a technology that was initially perceived as novel, spectacular and intriguing is now pervasive, ubiquitous and habitualised. It is thus ripe for return in a new unsettling form.

Affect

In this section I outline connections between philosophical affect theory, moving image, animation and the uncanny. Later, I will develop the connections between affect, the uncanny and the specifics of my artistic research practice. I am using the work of the political philosopher and social theorist Brian Massumi as the starting point for discussing affect. Massumi’s understanding of affect derives from Spinoza and Deleuze, emphasising bodily or embodied experience, and differs in important ways from the use of the term in psychology. Shavero summarises Massumi’s view as follows:

‘For Massumi, affect is primary, non-conscious, asubjective or presubjective, asignifying, unqualified and intensive; while emotion is derivative, conscious, qualified and meaningful, a ‘content’ that can be attributed to an already-constituted subject. Emotion is affect captured by a subject, or tamed and reduced to the extent that it becomes commensurate with that subject. Subjects are overwhelmed and traversed by affect, but they have or possess their own emotions. (2010:3)

Affect is an intensity, an overwhelming surplus that is pre-subjective and non-individual. Affect is something that occurs before we are even conscious of it. Only afterwards can we reflect on it and attribute emotion to our experience. It seems to follow that for perceptual phenomena that we find ourselves unable to demystify, or unsee, like CGI matchmoved into moving camera footage, or the apparent movement of frames in a flip book (even when we can see or are subsequently shown exactly how they work), we cannot apprehend these things consciously before they have worked their illusion on us. These things seem to take place in what Massumi calls the ‘missing half second’ where ‘...something that happens too quickly to have happened, actually, is *virtual*’ (2002:30). Thus we could look to affect theory for a model of our engagement with this practice. Affect gives us ways to think the world that our bodies move in. It helps us think about our strange, unexpected and powerful reactions to art, design, film, animation fashion and photography. For Massumi, our conscious experience is a fraction of our lived engagement with the virtual; it is a kind of story that we tell ourselves only after we have taken decisions and had experiences. We participate in the virtual through affect and affects are in a ‘...realm of intensity...’ that is somehow neither transcendent nor ‘exactly outside experience either...[but] immanent to it’ (2002:33). So ‘Affects are *virtual synesthetic perspectives* anchored in (functionally limited by) the actually existing, particular things that embody them’ (2002:35, italics in original). The difficulty in imagining something that is asubjective, consciously inaccessible and takes simultaneous perspectives from within, outside and through our bodies is reflected in the difficulty in writing about it. Affect is an immanent anteriority prior and post to any of our attempts to conceptualise it.

Jenkins (2013) makes a connection between animation and Deleuzian/Massumian affect theory. Interestingly, he does this through Roland Barthes' concept of the *punctum*. Where the *punctum* is something normally associated with the still photographic image, Jenkins argues that the *punctum* is a presubjective affect and that there is a further kind of *punctum* 'unique to animated films' (2013:576). This is the '..."prick" from sensing a *never-has-been* character as alive ...' (2013:576, italics in original)

Like the *punctum* of death, animation's *punctum* is one of intensity, not form of time and death's counterpart – life. If photographs portray a "that has been" that can lead to the contemplation of time, animation presents a "*never-has-been*" that seems to live in time. Viewers likely know the figures are not alive, yet they appear to move, speak, react, feel and even die. (2013: 583, italics in original)

This concept of the intensity of a 'never-has-been' image, moving with the illusion of life refers to the reaction of audiences to early animation on the cinema screen but it is easy to make the leap to thinking about CGI and the animation of visual effects. By invoking animism and the impression of life in dead materials, Jenkins' *punctum* of animation has a strong sense of the uncanny.

In the quotation that follows, Gunning uses a form of words that suggests a connection between affect and the uncanny.

I acknowledge the problem that this definition [of the uncanny] depends partly on an affective response (the uncanny shudder that would seem to generate the phenomenon) that is hard to generalise. (2008:69).

Here, without explicitly acknowledging Massumi's concept of affect, Gunning seems to point in the direction of affect theory as a direction of enquiry. The phrase 'uncanny shudder' (2008:69) in particular, is striking as it evokes our traversal by the involuntary embodied intensity of

uncanny experience. The uncanny, rather than being accompanied by bodily reactions, such a queasy tightening of the stomach, a shudder and crawling skin *is* those embodied affects. We then package up this intensity, to 'have or possess' (Shaviro, 2010:3) the uncanny affect as something that we may conceptualise and theorise, abhor or enjoy. At this point it is possible to suggest that affect permeates animation, the life of images, the illusion of life in animation, post cinema, CG visual effects and the uncanny.

Artistic Context

This section briefly introduces a limited subset of visual and media artists whose work has bearing on the research context for the practice presented in this thesis. I include art that has influenced the content and formal qualities of my work and also that which impacted the conceptual framework for the practice.

Pablo Valbuena

The practice of the media installation artist Pablo Valbuena is relevant in terms of his approach to site specificity, technological illusionistic *trompe l'oeil* interventions in the exhibition space and use of animation. Valbuena's "Extension Series" projects a virtual space onto the actual space. It virtualises what is real and actualises what is virtual. The result is a projected space: a visible space, based on the tangible space.' (Van Bogaert, 2009). Valbuena's artwork raises questions of our understanding of and relationship to our environment. It creates, through repetition, redrawing and superimposition a *mise en abyme* and a new relationship with the built environment. The light forms are '...Injections of light that make the space implode...' (Van Bogaert, 2009) The similarity to Baroque period *trompe l'oeil* is twofold; primarily and most obviously in the use of optics, illusion and perspectival effects to visually extend the architectural space but also in the virtuosic application of new technology to create awe and spectacle. This combinatory tendency is explored by Ndalianis in her book 'Neo Baroque Aesthetics and Contemporary Entertainment' (2005) in which visual effects driven blockbuster films of the 1990s and media arts of the late twentieth and early twenty-first century are exemplary cases. The urge of artists to use the latest developments in technology (for example, projection mapping, virtual reality, augmented reality, geolocation, artificial intelligence, procedural image generation and biotechnology) is common to much media art and clearly integral to work that is defined as 'new media art'. The artistic practice of Memo Akten (www.memo.tv, no date) is an excellent example of this type of wide-ranging approach whose commonality is an engagement with new technologies or new applications of those technologies. This kind of work depends on and explores the sense of wonder and novelty that

greet the introduction of new technologies to society, and partly relies on this factor for its impact. This kind of media art practitioner must therefore work at the technological avant-garde, adopting early and anticipating new developments. This is not intended as a criticism of this kind of work; indeed, it can create intense, unselfconscious, performative engagement from its audience and, as its technologies become commonplace or, eventually, obsolete they can raise a host of interesting questions on the role of technology in society and the potential for the loss of information and culture in a period of rapid scientific and technological development. Defining this tendency does however provide an opportunity to use this definition in opposition to the practice presented in this thesis. The technology employed in my work is not novel or avant-garde; it is ubiquitous and mostly unremarkable in practice. It is for this reason that I have been cautious about employing newer technologies in the practice such as real-time augmented reality.



Fig. 4 Valbuena, P. (2011) *para-site*

Saskia Olde Wolbers

Olde Wolbers works with analogically produced uncanny moving imagery, creating formal qualities and associations with clear connections to my practice. The use of narrative and voiceover is a compelling part of the work that has a peculiar impact on the imagery, or perhaps the imagery creates the space within which the narratives operate. In her work there is a sense

that the spaces portrayed have a relation to the mind and the unconscious. The model sets, filmed underwater, at unusual angles – the audience sees drifting things pass sideways or upwards across the screen - renders the time and space of these worlds indeterminate. The imagery is at once tangible and distant, dreamlike, ‘...it is deeply, almost soporifically hypnotic, its woozy perspectives a good match for the indeterminacy of the protagonists roles.’ (Princenthal, 2006). This creates a space in which her narratives can unfold. Olde Wolbers work also becomes uncanny through spatial indeterminacy. The use of miniatures and models, filmed in such a way as to shift our perception of scale and weight is reminiscent of the use of practical visual effects in science fiction cinema of the twentieth century. In common with Ed Atkins’ work, real voice performances are used off camera, with the screen showing artificially constructed spaces.



Fig. 5 Wolbers, S. (2014) *Yes These Eyes are the Windows*

Bruce Nauman

Nauman’s early video installations are disturbingly effective in the simplicity with which they create uncanny dissociative experiences and explore the medium-specific qualities of video in

the context of installation. The experience of moving in his 'Live Taped Video Corridor' has been hugely influential in terms of the possibilities of installation art. Nauman has stated of this work that he '...used a wide-angle lens and it was above and behind you as you walked into the corridors, so you were removed from yourself, sort of doubly removed...' (Nauman, 1980:128) Nauman describes the work as being disconcerting, like the finding that the last anticipated step of a staircase is not there; "That kind of misstep surprises you every time it happens. Even when you knew how those pieces were working, as the camera was always in front of you, but they seemed to work every time anyway.' (Nauman, 1980:128). This phenomenon of a trick or illusion that may operate in plain sight without relying on obfuscation or distraction is common to animation as well as the matchmoving and 3D tracking techniques used in my practice (this is discussed in more detail in the section on animation). The disconnect between one's conception of the environment, the quasi-autonomous muscle memory of unconscious movement (such as walking down stairs) and the actual physical environment (when the floor prevents your foot going down another step) is enough to jolt one out of ordinary experience. This experience of dissonance between the various layers of mental operation shares uncanny qualities with optical illusions, and the mechanics of moving imagery.

This strange state of perception that Nauman describes and I recall from being in the video corridor may bear comparison with the experiment known as the 'rubber hand illusion' (Botvinick and Cohen, 1998), in which the experimental subject relocates the sensed position of their own hand towards that of a false hand that is being stimulated in the same way as the real (hidden) one (Kammers et al., 2009). The experience uncannily doubles the subject's own body and its representation or reflection becomes a question rather than a reassurance. The idea that identifying the image one's own body is disruptive, uncanny and traumatic in some way leads us again to Lacan's concept of the mirror stage (Lacan, 1977:4).



Fig. 6 Nauman, B (1970) *Live-Taped Video Corridor* [Installation]. Solomon R. Guggenheim Museum, New York.

Zoe Beloff

Beloff is an interesting example of an artist exploring the uncanny, psychoanalysis and early media. In thinking ‘...about the late nineteenth century where there were many cinemas or...”economies of the moving image”’ (Beckman, 2006) she seeks to recall a period of dazzling possibilities, before the conventions of what we now call cinema became fixed.

In her interactive media installation ‘The influencing machine of Miss Natalia A. (2003) she creates a ‘phantasmogoric presence or immersion into the mental topography of the schizophrenic (Grau, 2007:137). The artwork is based on the delusional ideation of Natalia A., a patient of Freudian analyst Victor Tausk, who believed that her mind was being affected

remotely by a device operated by doctors in Berlin. The artwork plays on the notion that we experience the uncanny when ‘...primitive beliefs we have surmounted seem once more to be confirmed’ (Freud, 1919:17) and, through its interactivity, makes the audience complicit in the operation of the machine (Beckman, 2006:8). The work employs phantagrams, anamorphically distorted stereoscopic images, giving the impression of ghostly presences in the installation space. Beloff’s idea of characters crossing over into our world, our space (Beckman, 2006:6) has clear parallels with the development of my practice, especially in terms of the conceptualisation of the CG objects as residents of another space that become visitors to our world.

Grau suggests that Beloff’s work is an encounter with the uncanny in that it shows ‘...the resurfacing of infantile conceptions of life that the rational adult imagines have been overcome. It is telling that Natalia A.’s delusions should focus on technology, allowing Beloff to demonstrate ‘...that machines are not mere tools and emphasises just how deeply rooted technological media are in the subconscious, in media history, in the space of utopian projections and how they transport magical beliefs.’ (Grau, 2007:138). Echoing Gunning, speaking of a culturally entrenched technology (in this case recorded sound) Beloff asks, ‘How can we get back into that space where it becomes strange again?’ (Beckman, 2006). Beloff has also stated of her practice that she ‘...wanted to find a way to de-familiarize cinema, to make the present-day audience feel like they were seeing film for the first time.’ (Beloff, 2011). Defamiliarisation, as discussed earlier, is an artistic tactic for re-newing the impact of established technologies that may be mediated by the phenomenon of the uncanny (Gunning, 2003).

Ed Atkins



Fig. 7 Atkins, E. (2014) *Ribbons*

Ed Atkins' recent work employs CGI and motion capture technologies to create video installations. The CG models used in his work are purchased from online libraries of 3D content rather than modelled from scratch, contrasting with the specific, performative physicality of the motion capture (Spampinato, 2014:19). Atkins explores the intrinsic nature and qualities of the technology in his work '...to speak precisely of what it is not and what it cannot do' (Atkins, cited in Spampinato, 2014:191). The CG figures in the work are at once '...virtuosic and totally abject...' and 'as alive and dead as a CGI thing can get' (De Abaitua, 2014:online).

In 'Ribbons' (2014) Atkins performs using motion capture technology, through a computer generated avatar. 'The resulting avatar is an uncanny surrogate of the artist, who in speaking

regresses to the past, disclosing feelings and emotions that social reality tends to hide.’ (Spampinato, 2016:). This use of a digital avatar results in a kind of posthuman mediated performance and a new ‘condition of virtuality’ (Remshardt, 2008)

As well as the more obvious associations with the uncanny valley in Atkins’ work the concept of abjection is also brought into play by the performative qualities of the avatars, their relation to Atkins’ body, the more direct expression of his voice (the body and face is mediated through performance capture to a digital avatar, whereas the voice is directly recorded) and the nature of the script. The characters or bodies in the artworks are often described as abject (Atkins et al., 2014: De Abaitua, 2014: Durbin, 2016). According to Kristeva, one way that abjection distinguishes itself from the uncanny through its lack of familiarity; ‘Essentially different from “uncanniness,” more violent too, abjection is elaborated through a failure to recognise its kin: nothing is familiar, not even the shadow of a memory.’ (Kristeva, 2010:14). Abjection is a breakdown of Lacan’s symbolic order, of the distinction between subject and object, the return of a ‘primal repression’ (2010:11). It is an unbearable irruption of the Real into the symbolic order created by language. The Real here includes everything that language allows us to identify but that in doing so irrevocably separates us from it.

We are no longer within the sphere of the unconscious but at the limit of primal repression that, nevertheless, has discovered an intrinsically corporeal and already signifying brand, symptom and sign: repugnance, disgust, abjection.’ (Kristeva, 2010:14)

The repulsively pitiful quality of abjection in these characters was in my mind as I created CGI ‘visitors’ to our worlds. In some cases, such as ITA Railings, (fig. 27) the objects seem to be trying to adopt characteristics of their surroundings but draw attention by the spasmodic nature of their movement, ill adapted to oxygen and gravity, as if growing, reproducing, suffering and dying all at once. In I Feel Myself Looked at by the Things (fig. 30-33) I contrast the fluid, muscular movement of the Bellmer character in the space behind the screen to when it later

becomes the handles on the drawers of the dressing table, characterised by tetanic rigidity followed by sudden collapse.

Brass Art

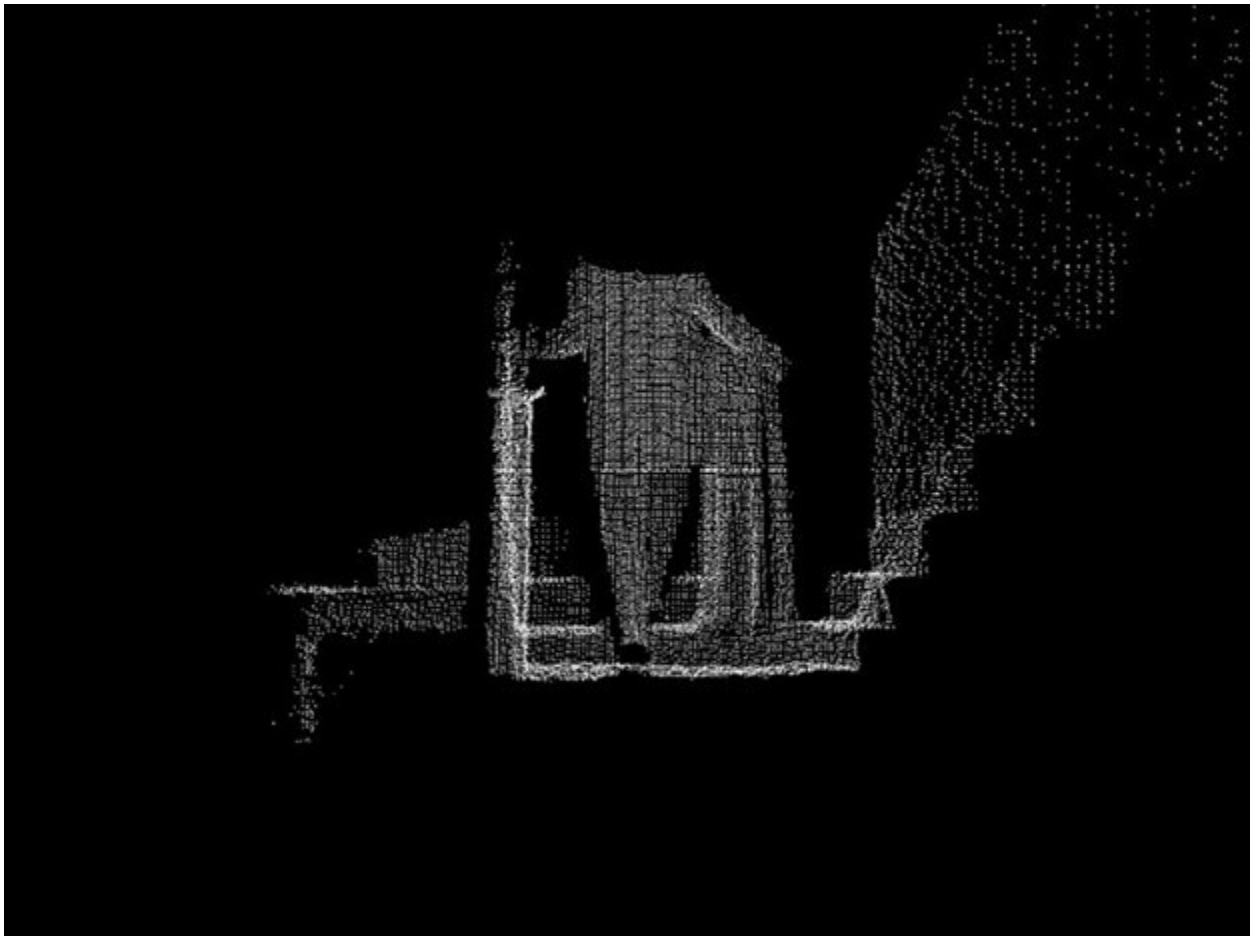


Fig 8. Brass Art (2015) *Freud's House: The Double*

During a period of residency, the artists inscribed themselves into the domestic space of Sigmund Freud's former London home. Using Kinect laser-sensors and Processing software to capture intimate-scaled performances throughout the rooms, staircase and hallway, Brass Art developed a visual response to the notion of the uncanny using strategies of repetition and simultaneous doublings. (*Brass Art*, no date:online)

Brass Art are a collective whose work explicitly references Freud and the uncanny, reanimation and the double (Lewis et al., 2012:330). As well as the uncanny, they take an interest in the limen – thresholds between the real and virtual realms (2012:330) and the ‘phenomenology of wonder’ (2012:331). As in my practice, the uncanny is theorised as a mediating agent or force that may reveal what has previously been hidden:

‘The uncanny pervades time, slipping forwards and backwards, unravelling the past and creating the future. Light slips secretly between us and those who came before us. Like an agent of wonder, it reveals a mysterious realm.’ (2012:336)

In the case of the ‘Shadow Worlds | Writers’ Rooms’ project, Microsoft Kinect sensors were used to build three-dimensional point-cloud representations of performers moving in space. Once acquired, the virtual camera can then move around these data points, which the audience recognises as moving figures within interior spaces. The phantasmic traces of the performers are seen from impossible angles as the point of view wheels and loops around the clusters of vertices. The information is presented as colourless, sculptural yet insubstantial doubles of real spaces and bodies. Shadow Worlds, as ‘...an investigation of simple, domestic spaces creates the possibility of thinking about the everyday, the ordinary and the familiar as the most vivid potential sites for uncanny revelation and transformation’ (Lewis et al., 2014:9). The domestic space, as something that is especially intimate, private and familiar, is full of uncanny potential. These associations led me to experiment with using a domestic dressing table later in the development of the practice (fig 30-33).

Brass Art also refer to the *mise en abyme* within their practice; ‘Within Freud’s house we can experience most clearly the *mise en abyme* – an important motif within our collaborative practice...’ (Lewis et al., 2014:6, italics in original). This phrase most commonly refers to a picture that depicts a copy of itself within the pictorial space, a doubling that also occurs when

two mirrors face each other. It is, as Mitchell would characterise it, a metapicture (2006). The *mise en abyme* in art can also be conceptual, temporal, kinetic or, as I discuss later, ontological.

The practice of Brass art as a collective, while it exploits new technologies, retains a media historical/media archaeological approach to their use. They were drawn to ‘...pre-cinematic spectacle as an important area for research...’ (Lewis et al., 2012:336). The artwork incorporates these technologies within a body of practice that does not necessarily privilege novelty and relates the uncanny technological aspects of their practice to a historical context. Their work, in referencing phantasmagoria, early modern scientific and optical discoveries (Lewis et al., 2012:331) is similar to that of Zoe Beloff, who has characterised herself as a media archaeological artist (Parikka, 2011).

Mike Kelley

Mike Kelley’s exhibition, book and essay ‘The Uncanny’ (2004) has been an exemplar ongoing source of uncanny imagery. Still fascinating and disturbing to me, it elicits a physical reaction and acts as a reminder of the ungraspable nature of the uncanny. The exhibition catalogue also serves to demonstrate the importance of context in the uncanny experience, as in the collections of shot glasses, spoons, vinyl record covers, calling cards, pornography and comics that fill the latter pages of the book; these would not have an uncanny impact individually but are powerful within their wider context.

In his accompanying essay Kelley states that ‘...the uncanny is apprehended as a physical sensation, like the one I have always associated with an ‘art’ experience – especially when we interact with an object or film.’ (Kelley et al., 2004:26). This conception of the uncanny as an embodied affect is explored later in relation to the theories of Brian Massumi. Also striking is the description of the uncanny as ‘...the unfamiliar familiar, the conventional made suspect’ (2004:37). The condition of being *suspect*, arousing or being treated with suspicion describes particularly well the heightened attention we pay to things (art, bodies, situations) when they are brought to our attention through the phenomenon of the uncanny.

Kelley discusses the uncanny qualities of Bruce Nauman's work, which is included in the exhibition (Kelley et al., 2004:31). '...Nauman's uncomfortably dysfunctional formalism' (2004:32) characterises a challenging, resistant quality in Nauman's work that sometimes spills over into the uncanny.

An interesting point is made in relation to the role of colour and surface quality in sculptural objects, such as painted classical statuary and the fleshlike materials of dummies or waxworks. This is related at once to kitsch and to the uncanny as something distastefully or disturbingly specific, as opposed to archetypal, as exemplified by polished marble statuary. In simulating the specific surface qualities of bodies, artists move against the modernist idea of truth to material. This can result in an uncanny quality, seen for instance in the sculpture of Ron Mueck. (2004:29-31). Practical visual effects props for film tend to share this quality of surface mimicry and simulation (2004:27-28). Digitally produced visual effects have also tended to follow in this tendency to produce a photorealistic surface over a sculptural armature (although the armature in this case is a rigged skeleton deforming a polygonal skin). The sense that one is being tricked by something that is perceptually real is part of the uncanny potentiality of computer generated imagery.

Manifest AR and augmented reality art

Manifest AR (Manifest.AR, n.d.) are an international artists' collective working with augmented reality as '...interventionist public art.' (n.d.). They work with locative virtual objects, collage-like overlays and interactive monuments. These artworks generally use a combination of mobile device, such as an iPad and an app in order to overlay imagery on a location. Commercial applications include the popular recent AR game *Pokémon Go* (Catch Pokémon in the Real World with Pokémon GO!, n.d.) and face changing apps, such as *Snapchat Lenses* (Snapchat, n.d.) use similar approaches in a popular context. Artist Tamiko Thiel (Online Portfolio augmented reality art virtual reality art in public space Manifest.AR, n.d.) recently worked on a

project called 'Gardens of the Anthropocene' (2016). In this work, she superimposes over an existing landscape a dystopic future in which plants have evolved in response to climate change



Fig 9 Thiel, T. (2016) Gardens of the Anthropocene

Ivana Bašić, as part of her sculptural practice, is in the process of creating a digital double of herself (SOMA / work in progress : Ivana Bašić, n.d.). This is being marketed as a product for sale alongside other digital assets in online marketplaces such as Turbosquid (3D Models for Professionals :: TurboSquid, n.d.). These models may be used for visual effects, games, animations or as Karen Archey suggests, even 3D pornography (2016:198). In the project Bašić '...aims to democratize her appearance and identity'. In marketing herself amongst generic and formulaic digital assets, the 3D equivalent of stock photography, she has also created an uncanny double which reflects the abject qualities of this type of product but also has many of her specific characteristics. In the next stage of the project, she plans to present the animated model as an augmented reality exhibit that appears on an empty plinth.

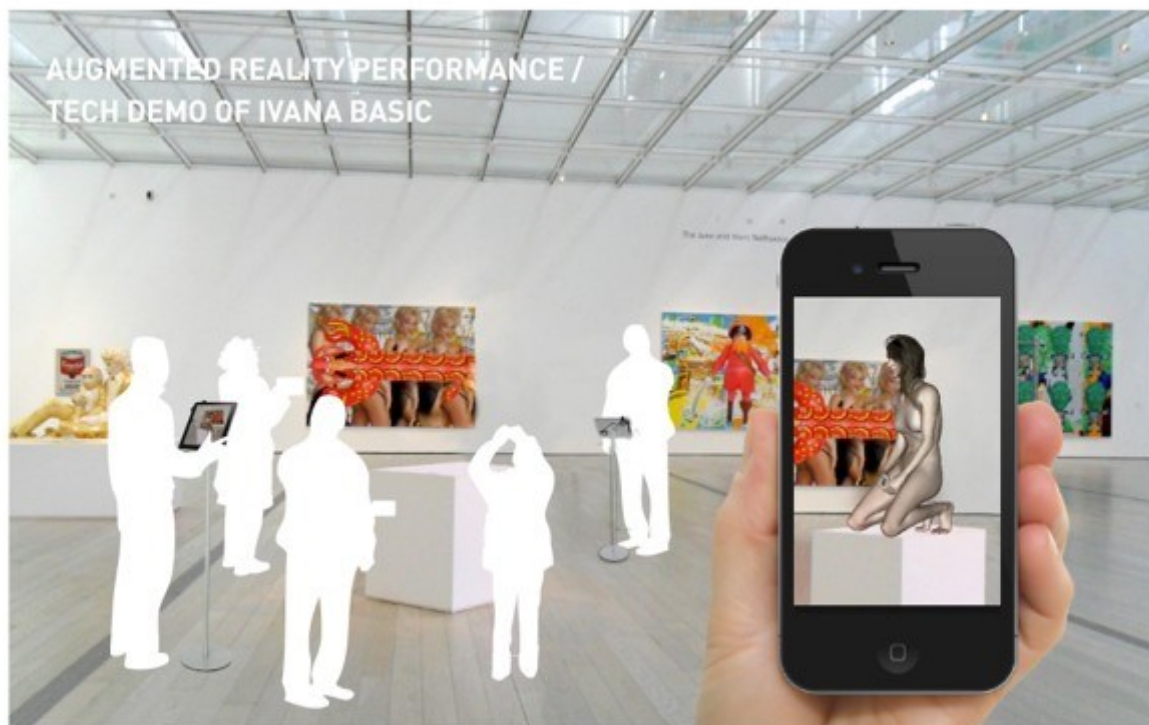


Fig. 10 Bašić, I (2013-) SOMA augmented reality



Fig. 11 Bašić , I (2013-) SOMA digital 3D model

Apart from working consciously with the novelty of this technology, augmented reality presents opportunities to create physical engagement from the audience, potentially rich interactivity and the possibility, key to much installation art, of defamiliarising the environment, leading to heightened engagement. As I have argued elsewhere, the uncanny focus of my practice centres on the use of an established, mature and ubiquitous technology. I have consciously chosen not to work with leading edge technologies up to this point. Additionally, for locative AR artworks like this the visual qualities of the experience are dictated by the power and speed of current mobile technologies. They tend to require the simultaneous combination of a live video feed via the device's camera, motion tracking, pattern recognition, geolocation and compass, internet connectivity and realtime 3D overlays. This means that the experience tends to be marked by slight pauses and delays as feature are recognised, a lack of occlusion, low polygon 3D elements and simple lighting and surface qualities. These qualities do not necessarily detract from and may indeed add to the intended experience. Real-time graphics, however, although much improved and constantly developing, lag behind the quality achieved by the much slower and

more computationally intensive approaches used by the visual effects industry. It is this near seamless and thus potentially hidden quality of post-cinematic visual effects that I have focussed on in this research.

Virtual and mixed reality

Products such as Microsoft's HoloLens mixed reality device (Microsoft, n.d.), and Oculus Rift (Oculus, n.d.) or HTC Vive (Vive | Discover Virtual Reality Beyond Imagination, n.d.) virtual reality headsets offer the potential for far more fluid, immersive and visually sophisticated experiences than past augmented reality apps. Immersive virtual reality using stereoscopic headsets have been a coming technology for many years (Mims, 2010) but the hardware has now arrived at the point of practicality and responsiveness. Artists using the technology within exhibitions include Jon Rafman, whose artwork *Sculpture Garden (Hedge Maze)* uses Oculus Rift as part of the experience (fig. 12). Alongside references to mythology a recurring element of the practice is a formless slime, the reified ectoplasmic 'waste of transmission' between the material and immaterial worlds (Zhexi Zhang, 2016). Linking the virtual worlds of online spaces to the etheric spiritual medium is another example of the uncanny implications of novel technologies.



Fig. 12 Rafman, J. (2015) Sculpture Garden (Hedge Maze)



fig. 13 Rafman, J. (2016) image from *Studio* Tumblr blog



Fig. 14 Rafman, J. (2016) image from *Studio* Tumblr blog



Fig. 15 Rossin, R. *Virtual Reality: n=7 / The Wake of Heat in Collapse* (Installation view)

Rachel Rossin is also working with pre-release virtual reality hardware to create immersive interactive experiences, combining painting and virtual environments. At this time, the potential for VR to be used in a gallery space in the early stages of exploration and combines intriguing possibilities with some awkwardness and irritations (Chan, 2016). At this point it is unclear if the singular, isolated experience of using VR will work well in a gallery situation.

Lovecraft, Lem and Massumi

I present here three longer excerpts from texts that have had an impact on the artistic practice. They have influenced and inspired me in the same way that a painting or a film might do, yet have also impressed themselves on the conceptual framework for the research. In this way they occupy their own space between the theory and practice. I read these texts with attention for

the stylistic elements of the writing as well as the sense that the authors are stretching, reaching and often overreaching in an effort to describe *things* that are indescribable, beyond human understanding and comprehension, but doing so in a way that is strikingly visual and relies on visual formal qualities, geometrical, natural and topological metaphors for their impact.

The effect was that of a Cyclopean city of no architecture known to man or to human imagination, with vast aggregations of night-black masonry embodying monstrous perversions of geometrical laws. There were truncated cones, sometimes terraced or fluted, surmounted by tall cylindrical shafts here and there bulbously enlarged and often capped with tiers of thinnish scalloped disks; and strange beetling, table-like constructions suggesting piles of multitudinous rectangular slabs or circular plates or five-pointed stars with each one overlapping the one beneath. There were composite cones and pyramids either alone or surmounting cylinders or cubes or flatter truncated cones and pyramids, and occasional needle-like spires in curious clusters of five. All of these febrile structures seemed knit together by tubular bridges crossing from one to the other at various dizzy heights, and the implied scale of the whole was terrifying and oppressive in its sheer gigantism. The general type of mirage was not unlike some of the wilder forms observed and drawn by the arctic whaler Scoresby in 1820, but at this time and place, with those dark, unknown mountain peaks soaring stupendously ahead, that anomalous elder-world discovery in our minds, and the pall of probable disaster enveloping the greater part of our expedition, we all seemed to find in it a taint of latent malignity and infinitely evil portent.

...

The nameless stone labyrinth consisted, for the most part, of walls from ten to one hundred and fifty feet in ice-clear height, and of a thickness varying from five to ten feet. It was composed mostly of prodigious blocks of dark primordial slate, schist, and

sandstone - blocks in many cases as large as 4 x 6 x 8 feet - though in several places it seemed to be carved out of a solid, uneven bed rock of preCambrian slate. The buildings were far from equal in size, there being innumerable honeycomb arrangements of enormous extent as well as smaller separate structures. The general shape of these things tended to be conical, pyramidal, or terraced; though there were many perfect cylinders, perfect cubes, clusters of cubes, and other rectangular forms, and a peculiar sprinkling of angled edifices whose five-pointed ground plan roughly suggested modern fortifications. The builders had made constant and expert use of the principle of the arch, and domes had probably existed in the city's heyday.

H.P. Lovecraft. *At the Mountains of Madness* (1931)

“Mimoids,” “symmetriads and “asymmetriads,” its “vertebrids” and “rapidos” sound terribly artificial, but they do give some idea of Solaris even to those who’ve seen nothing but a few blurry photographs and poor quality films. Of course, even this conscientious classifier was guilty of rash moments. Humans are constantly coming up with hypotheses, even when they’re being cautious, and even though they’re quite unaware of it. Giese believed that extensors constituted a root form, and he compared them to greatly magnified and heightened versions of tidal waves in terrestrial oceans. Besides, anyone who’s immersed himself in the first edition of the work knows that he originally named them precisely “tides” led by a geocentrism that would be amusing if it weren’t for his helplessness. For – if comparisons with Earth really do have to be employed – these are formations larger in magnitude than Colorado’s Grand Canyon, modelled in a substance that on the outside has the consistency of jelly and foam (though the foam hardens into vast, brittle garlands, into tracery with immense holes, while some scientists have seen it as “skeletal excrescences”). Within, it turns into an ever firmer substance, like a flexed muscle, but one that quickly, at a depth of fifty feet or so, grows harder than rock, though it retains its elasticity. Extending for several miles between walls that stretch like membranes over the monster’s back and cling to its huge “skeleton” is the actual extensor, a seemingly independent formation, like a colossal python that has swallowed an entire mountain chain and is now digesting it in silence, from time to time setting its body in slow, shuddering, fishlike contractions. But this is only what the extensor looks like from above, from the cabin of an aircraft. When you get close enough to it that the walls of the ravine rise hundreds of yards above the plane, the python’s torso turns out to be a moving expanse that stretches all the way to the horizon and is so dizzying it takes on the look of a passively bulging cylinder. The first impression is of a whirl of slick gray-green slime whose layers throw off powerful glints of sunlight; but when the craft hovers right over the surface (at such moments the edges of the ravine in which the extensor is concealed are like heights on either side of a geological depression), it can be seen that the motions are much more complex. They

possess their own concentric rotations, darker streams intersect, and at times the outer mantle becomes a mirrored surface reflecting clouds and sky and shot through with loud explosive eruptions of its half-fluid, half gaseous, center. It slowly becomes clear that right below you is the central point of the forces holding up the parted sides that soar high into the sky and are composed of sluggishly crystallizing jelly'

Stanislaw Lem. *Solaris* (1961)

According to Simondon, the dimension of the emergent – which he terms the “preindividual” – cannot be understood in terms of form, even if it infolds forms in a germinal state. It can only be analysed as a continuous but highly differentiated *field* that is “out of phase” with formed entities (that is, has a different topology and causal order from the “individuals” which arise from it and whose forms return to it).¹¹ A germinal or “implicit” form cannot be understood as a shape or structure. It is more a bundle of potential functions localised, as a differentiated region, within a larger field of potential. In each region a shape or structure begins to form, but no sooner dissolves as its region shifts in relation to the others with which it is in tension. There is a kind of bubbling of structuration in a turbulent soup of regions of swirling potential. The regions are separated from each other by dynamic thresholds rather than by boundaries. Simondon calls these regions of potential “quanta,” even as they appear on the macrophysical level and on the human level- hence the atomic allusion.¹² The “regions” are as abstract as they are actual, in the sense that they do not define bounded spaces but are rather mobile differentiations within an open field characterised by action at a distance between elements (attractors, gradients, resonance).

Brian Massumi. *The Autonomy of Affect* (2002)

Although it does not reflect the originally intended meaning of the phrase, the idea that they have a common ‘structure of feeling’ (Williams, cited in Shaviro, 2010:2), goes some way to explain the impact these texts have had on the practice. Within this writing there is an impossible urge to transcend the limits of thought and perception. Horror film and literature has been used by philosophers (Thacker, 2011: Trigg, 2014), as a way to explore the limits of the thinkable. The indescribable horror within Lovecraft’s writing comes at the point of failure and collapse of language in the face of ‘the-world-without-us’ (Thacker, 2011). I feel that the eventual resort to the non-description ‘indescribably horrific’ in Lovecraft should not be seen as a stylistic flaw of his writing (although it is an easy target). As in Lem, the failure of apprehension and comprehension is ours, as a species. For Lovecraft, witnessing and becoming even dimly aware of cosmic horror often leads to insanity or death and the compelling aesthetics of gateway artefacts lead to enmeshment in cosmic horror (Ralickas, 2008).

In Lem’s novel, the fantastical descriptions of the surface of the sentient planet Solaris are a pessimistic commentary on our desire and failure to escape our anthropocentric viewpoint in encounters with the *other*. The extraordinary descriptive detail serves, ironically, to emphasise our failure of understanding, our existence at the wrong scale and duration, and our collective deficiency of imagination. As if to counter this, Solaris reconstructs replicas of people from the memories of the scientists who study the planet. These uncanny doubles therefore could not be more familiar, knowing and possessing nothing of themselves beyond what is remembered from another’s point of view. They do not contain the unfamiliar majority of the other person that is made up of all their thoughts, memories and experiences that we are not privy to. In the novel these beings are initially terrifying and are met with violence. Further study reveals them to consist of a different form of matter than we do, but are superficially indistinguishable from living things.

Massumi describes the virtual, using language that is alternately compelling and ludicrous, but unfailing visual. The virtual seems to be a fractal, higher dimensional fluid, pervaded with

infolding 'branes, through which we which we are unknowingly swept. In the attempt to use language to discuss the large part of our existence that is prior to and apart from language and consciousness he could also be describing the alien, cosmic, vast and indifferent.

Within this writing is contained the knowledge and evidence of its own pointlessness, the impossibility of its aims and descriptions. Just as Lovecraft's envious protagonists congratulate the reader on their fortunate inability to *truly comprehend* the cosmic horror of the stories, thinking against the limits of thought is something that can only really be modelled in miniature, written around rather than done.

The impression of higher or other dimensional forms, imperfectly translated into our familiar space, distorted by gravity, crushed by our atmosphere, blindly reaching and finally adapting is a kind of visual narrative or implication I wished to convey through these artworks. We find the familiar here in our incapacity to conceive of or recognise something truly alien or other. In Hesse Tubes, (fig. 17) the forms resemble deep sea creatures. UCBC Twine and ITA Railings look like parasitic living outgrowths of the built environment. The Bellmer form of *I feel myself looked at by the things* (figs. 30-33) is represented as existing in screen space, that I conceived of as an inadequate projection of its home. As I have developed these forms I have felt the same sense of struggling to describe things which cannot adequately be conceptualised by my mind, much the same impression as given by Massumi's word-picture of the virtual and physicists' description of higher-dimensional spaces.

CHAPTER TWO: THE PRACTICE

CGI for beginners

Visual effects technologies and techniques such as 3D animation, 3D motion tracking, set extension, digital matte painting, and digital compositing are well established and commonly used in film and television production. They are also now readily accessible to practitioners outside of professional production; amateur enthusiasts such as the author of this thesis.

The work presented in this thesis makes extensive use of 3D tracking in live action video shots. This process allows for the reconstruction of a 3D scene from video or filmed footage and can include recreating the movements of the original camera in space. Computer generated imagery can then be animated, rendered and composited into the scene, giving the illusion that it is part of the original footage. For several of the pieces, such as SHEDthreads (fig.23), B_ARCH (figs.24-25), and ITA_Railings (figs.27-28), the completed video was presented as part of an installation, in close proximity to the location in which it was originally shot, allowing the audience the unusual experience of comparing an actual location to a digitally altered one. This approach simultaneously disrupts and emphasises the illusionistic nature of the work. This cognitive dissonance contributes to the uncanny impression given by the work.

The style of camerawork used is hand-held, rather shaky and clearly affected by my footfall as I move around the space. This type of shot is widely used in television and cinema to denote immediacy and what might be called 'documentary realism'. The 'found footage' genre of filmmaking, of which the low-budget horror film *The Blair Witch Project* (1999) is an influential example, demonstrates how this strategy or trope can be employed. Prior to the advent of 3D tracking technologies, it would not have been possible to match visual effects elements to rapidly moving camera shots; Visual effects were initially limited to a static camera position. Later, robotic motion control systems were used to match shots of miniatures to real camera moves but were generally limited to simple camera moves such as a slow dolly. Spielberg's

Close Encounters of the Third Kind (1977) has several examples of this kind of computer motion control effects shot. An example of how the found footage style has since been combined with digital visual effects to denote unmediated immediacy and documentary authenticity can be seen in the film *Cloverfield* (2008).

The level of malleability, their sculptural qualities, affordability, accessibility and crucially (to me) the freedom of the camera to move around and through their filmic space are either unique to or significantly enhanced by what we might call post-cinematic digital visual effects. The accessibility of the hardware and software to achieve these effects also means that someone like myself, being 'art-schooled' in painting, is able (with some effort and application) to use these technologies in their practice. In my case there has been a progression from limited awareness and some interest, to fascination, leading to explorations of the possibilities of these technologies and a growing comprehension of their relationships to theory.

The virtual objects or characters that I have introduced into the video footage seem to come from an airless dimension. They occupy a liminal zone between purposeful behaviour and senseless activity, between biomorphic and geometric forms. They may move in a way that gives the impression that they have a life and business of their own, like barnacles or anemones. They hide and disguise themselves but also draw attention. Their skin-like, pulsating surfaces add to the uncanny impact of the work. They may appear to be made of similar materials as their (inanimate) surroundings but in moving make this appearance impossible.

There is a kind of implied narrative to the practice and, while at this time I do not wish to impose this on the audience, I have been thinking of the animated sculptural 'characters' in the work as incursions into our world from an *other*, atemporal dimension. This is Lovecraftian in the sense of suggesting that indifferent or actively malevolent forces exist just beyond our perception. I think of them as indescribable (another Lovecraftian favourite) in that they appear to have familiar forms but only through the necessity of interacting with a given physical space or set of dimensions. Prior to this point the animated figures have been 'visitors' to spaces that

my audience also physically occupy. The final piece presented here shows both visitors here and 'residents' through a 'portal' into their world (figs. 30-31).



Fig. 16 *5th Floor* (2010) video still. <https://vimeo.com/8452838>

'*5th Floor*' (fig. 16) was the first piece where I used 3D tracking to matchmove CGI elements into a moving camera shot. I was fascinated with the process of animating sculptural forms within the video footage and the process of creating the visual cues that lead to a perceptually plausible end result. The CG object clearly does not belong in the shot, despite casting a shadow, creating a reflection and having a skin-like surface. It is not a familiar object but assimilates aspects of our visual experience to appear as if it might be. It is suspect in this scene. The methods of visual effects and, especially for me, the blending of recorded and

computer rendered domains are ‘magical operations’ (Gunning, 2003:47), impossible yet plausible visual experiences that recall the stirrings of repressed, vestigial and primitive magical and animistic beliefs described in Freud’s essay (1919). Crucially, the magical qualities of these effects are not necessarily diminished by possessing detailed knowledge of their technological underpinnings and production. This puts them in the category of philosophical toys rather than conjuring tricks, as so deftly explained by Gunning in comparing the flick book to the flip book (2013:62)

In the practice that followed, I began to progressively develop uncanny connotations and implications in the forms of the objects in the scenes, their movement through animation, their relation to the recorded environment and their relationship, through installation, to their surroundings in the world. The practice uses computer generated imagery, in relation to recorded digital video footage and then to real environments, to examine and illuminate the nature of CG in post-cinematic visual culture. This is a reflexive approach, where the aim is for the different aspects of the installation and imagery to reinforce one another around the locus of post cinematic visual effects.

As Gunning describes, (2003), strategies of defamiliarisation can cause a renewed focus on the extraordinary qualities of what were once novel technologies with the uncanny as a mediating force. The practice presented here has explored different approaches to achieving this. Presenting visual effects shots in isolation from a larger narrative context (such as a television programme or film) isolates them from the structures that would normally support their acceptance. Showing the video in the same space as the original footage was shot, a type of site-specificity that again comes from installation art and the carnivalesque presentation of early cinema, seems to simultaneously break and reinforce its illusory qualities. The imagery has deliberate cues that put it in an ambiguous relationship with its surroundings, making it ‘not at home’ in the presented space. This conflicts with the forms apparent attempts to fit in (such as matching the surface qualities of surrounding objects or gaining a use value like the drawer handles of *I feel myself looked at by the things*).

Familiarity has been established as being integral to uncanny experience. This sense of familiarity is found at many levels in the practice, through the use of mundane locations. The familiarity of domestic objects and furniture. The documentary/found footage cinematographic style is familiar. There is visual familiarity in recognisable surface qualities, a doubling of real materials. And in doubling the viewer, nothing could be more familiar or more troubling than one's own reflection.

In terms of the doubles in the artwork, the tendency is for these doubles is to redouble or multiply. Of course, a CGI representation of an actual object, person or animal is a double. However, any representation of any object, whether it exists or not, is a kind of double. At the moment one sees a representation of an object it is doubled in the process of our apprehension of it. In presenting a video of a space you currently occupy that space is doubled. The visual cues of photorealism in CGI can be enough to convince us of the existence of a rendered object, creating, rather than a ghostly double, a *ghostly original*. Later in the practice with 'I feel myself looked at by the things' the doubles were redoubled. This was done by the re-representation of the physical dressing table from the installation in the video. The 'mirrors' on the table are doubled as CGI in the animation. These mirrors reflect and thus double the viewer as she or he sits to engage with the installation. The Bellmer character is doubled as the CGI 'handles' on the drawers and again as the 3D printed handles in the installation. The recursive doubling here adds to a sense of uncertainty of what is real, what is present, what was present, what was recorded.



Fig. 17: *Hesse Tubes* (2014). Video still. <https://vimeo.com/112742348>

'Hesse Tubes (Fig. 17) was shot near my home. The 'visitors' here, subtly animated tubular forms growing out from the real wooden slats, were based on forms created by the sculptor Eva Hesse (fig. 18). Hesse's work has an uncanny quality that seems to derive from the indeterminate qualities of the work, which is often poised precisely between biomorphic and geometric form, biological and industrial materials and surfaces, with populations of variable and unique yet repetitive and interchangeable individuals. These are qualities I sought to evoke and develop in the CGI elements in the practice.



Fig. 18 Hesse, E. (1968) *Repetition Nineteen III*

Hesse's subversive minimalism, its subtle humour, biological references and populations of objects with minor variations have been useful and influential on a range of levels in the research.



Fig. 19: *Box Shadow* (2015). Video still. <https://vimeo.com/112756326>



Fig. 20: still from unedited video used in *UCBC Twine*



Fig. 21: *UCBC Twine* (2015). Video still. <https://vimeo.com/116368547>

'Box Shadow' (fig.19) and *'UCBC Twine'* (fig. 21) were developed to be displayed, site-specifically, in or near the space that they were originally filmed in, the atrium of the University Centre Blackburn College. This was the first experiment with presenting visual effects shots, or virtual animated sculptural installations in the same space as the original shot (the background plate). This allows the viewer to 'bounce' between the real and the unreal (but perceptually real). In *UCBC Twine* the tangled, tentacular forms emerge from a brick wall, block-paved floor and the side of a red metal bicycle locker, changing colour based on their proximity to different materials. Reflection and shadow passes, composited back over the original footage help to visually ground the computer-generated elements in the composition. After seeing the video in a presentation, one of my undergraduate students visited the real location expecting to see the red tentacles. This encouraged me to further develop the site-specific aspect of the practice.

The visual trope of emerging tentacles in this piece is the most direct reference to horror film and literature of the works. As well as Duchamp, I wanted to make a connection with the literature of H.P. Lovecraft here, in particular the atavistic hybrid human/sea creatures of *The Shadow over Innsmouth* (1999). Other reference points were the protean mass of *The Thing* [1982] and the uncanny pod people of Jack Finney's *Body Snatchers* [2010]

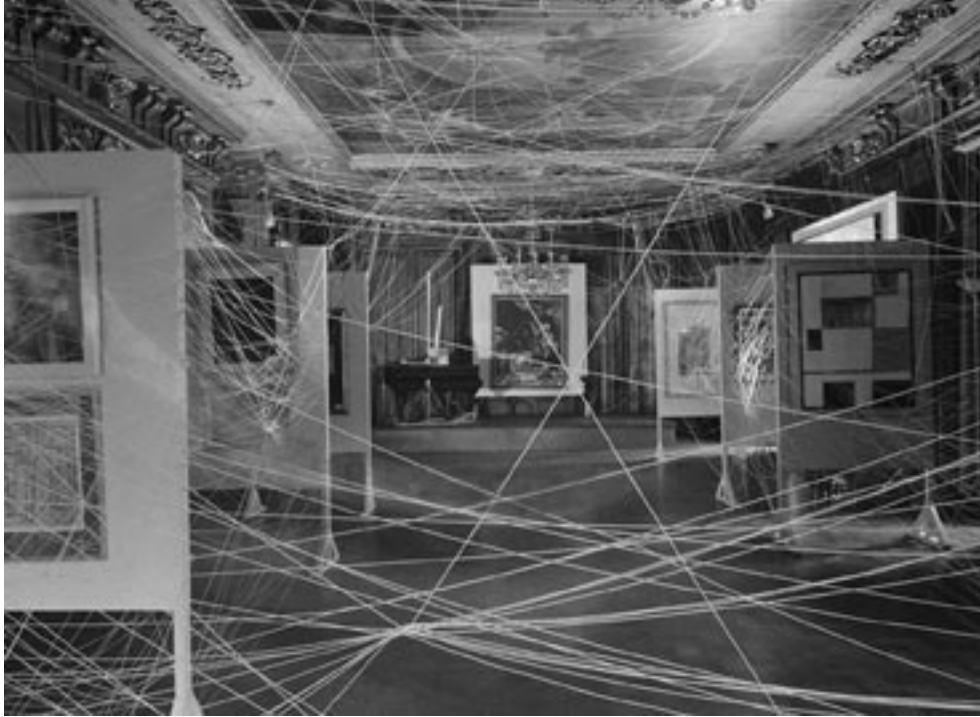


Fig. 22 Duchamp M. (1942) *his twine*

Duchamp's intervention in The First Papers of Surrealism exhibition (1942), known as '*his twine*' was a direct point of reference in *UCBC Twine* (fig. 21). In my work the 'twine' takes the form of pulsating tentacular extensions to a red bike locker. Duchamp's twine is still subversive, looking like an alien incursion into the gallery space and effectively recontextualising and conceptually colouring everything around it.



Fig. 23: *SHEDthreads* (2015). Video still. <https://vimeo.com/124765200>



Fig. 24: *B_ARCH* (2015). Installation view. <https://vimeo.com/127640300>



Fig. 25: *B_ARCH* (2015) video still. <https://vimeo.com/127640300>

B_ARCH (fig. 25) and *SHEDthreads* (fig. 23) were installed as part of the A\ /OID Exhibition at the Digital Innovation Shed, Manchester in May 2015. Here I explored architectural and graphic ideas inspired by the unusual interior space and made further developments in the sound and placement of the video relative to its original location. In *B_ARCH* the buttressed arch appeared to grow from the end of a large (real) lightbox. The web-like filaments in *SHEDthreads* appear to drift down over a raised mezzanine within the room.

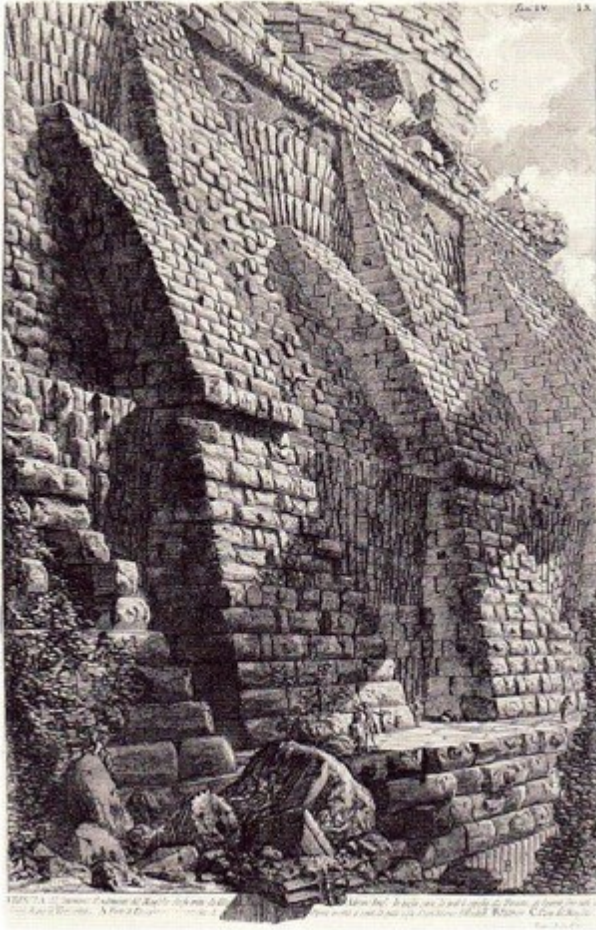


Fig 26. Piranesi, G. (c. 1756) *View of the subterranean foundations of the Mausoleum built by the Emperor Hadrian*

in producing 'B_ARCH' (Fig. 23) I found that the architectural prints of Piranesi resonated with Vidler's descriptions of the abyssal repetitions of the architectural uncanny (1992:37). I imagined a structure, a buttress, growing superfluously like a cancerous architectural detail in the interior space.

An issue that has arisen as a result of exhibiting the work has been a tension; on the one hand the strategy of presenting the completed shots plainly and simply in the same space as the original footage was shot demystifies the process, a kind of *verfremdungseffekt*, creating tension between the lack of pretence and artificiality making the perceptual plausibility of the

CGI composite more extraordinary. On the other hand is the impulse to make the installation experience more theatrical, immersive and to reference historical phantasmagoria in the installation. This might heighten the uncanny effect and imply associations with the effects such as magic, philosophical toys or pre-cinematic spectacle. The final work presented, I feel myself looked at by the things, takes more of an immersive, theatrical approach.



Fig. 27: ITA_Railings (2015). Video still. <https://vimeo.com/137760459>



Fig. 28: *ITA_Railings* (2015). Installation view, Oriel Sycharth Gallery.

ITA_Railings (figs. 27-28) was presented as part of 'Carbon Meets Silicon' an exhibition at Oriel Sycharth Gallery in September 2015. Installed on a landing area just outside of the main gallery, the animation shows metal railings in this unusual space that appear to have grown and are blindly reaching out across the floor towards the viewer. The video screen was shrouded with a hood, made of laser-cut foam board, aligned similarly to a mutoscope viewing slot. This intensified the audience engagement with the physical space and its augmented representation while preventing fully simultaneous viewing of the virtual and real spaces. The sound was developed further here, both in the variety and complexity of mixed Foley audio and in the placement of the speakers, making the apparent source of the sound close to the real railings in the space.

I feel myself looked at by the things



Fig. 29. Initial sketch of the dressing table video triptych.



Fig.30 *I feel myself looked at by the things (Hockeystick) (2016)*

<https://vimeo.com/179562882>



Fig. 31: *I feel myself looked at by the things* (Bellmer)



Fig. 32 *I feel myself looked at by the things*. original unaltered video footage



Fig. 33: *I feel myself looked at by the things (Scabby Chic)* (2016)

The final work presented here is the first to show the ‘residents’. I have been using individual names for each of the three sections of the video sequence: *Hockeystick* (fig. 30), *Bellmer* (fig. 31), and *Scabby Chic* (fig. 33), but the installation as a whole is titled *I feel myself looked at by the things* (the video can be viewed at the following link: <https://vimeo.com/179562882> and a video of the installation space here: <https://vimeo.com/188129721>). In the installation, a dressing table with what are apparently three ‘mirrors’ shows a video triptych. At times, abyssal views into their other, atemporal space appear in the reflective surface. These views are coloured by the surroundings, the material interface between the two places.

The edited video presented on the video triptych dressing table shows a kind of narrative development. Initially, the ‘hockeystick’ appears from the black (thus mirrored) screen. This phallic form moves in a kind of sheath or amniotic sac, which deforms and ripples in reaction to its movement. The hockeystick has surface qualities that are similar to the distressed surface of the dressing table.

In the next sequence, the background takes the form of many open boxes, echoing or absorbing the form and surface qualities of the table. There is an apparent movement among the boxes, which is generated at the intersection of invisible forms as they pass through the space. The Bellmer character swims or flies into the shot, apparently landing on the back surface of the screen, as if looking at the audience. It taps the screen and launches itself away with a movement that was intended to be reminiscent of a scuba diver’s back-roll into the water from a boat or a swimmer pushing away after completing a length of a pool. This sequence has the most challenging and complex character animation of the project so far. The weight, scale, impact, squash and stretch and the complex interplay between the ‘fingers’ and rapid movement and rotation of the body as a whole all had to be taken into consideration. Within the uncanny, I also wanted a sense of appeal (not exactly cuteness), but relatability and a range

of associations brought about by the animation itself rather than the form or visual qualities of the imagery.

The final sequence shows Bellmer as a visitor to our world. Here, things resembling *Bellmer* have taken the position of the drawer handles in a video sequence of the table. The animation is now driven by a dynamic simulation rather than keyframes, giving the movement the impression of death or collapse. The forms are distended, stretched or bloated where they have attempted to move. The position of the 'mirrors' on the real dressing table is matched by three CGI black boxes on the video (see figs. 32-33). These black areas of the screen become reflective when shown in the final installation.

Throughout the sequence the sound is used to add the impression of space and ambience as well as action and impact. These sounds were recorded from a variety of sources, including crushed dry leaves, a shaken bottle of window cleaner, a stretched elastic band, snapping spider silk and a bicycle drive chain. This use of Foley sound, rather than preset sounds and effects, adds to the footage adds to the impact of the work. Some sounds were used in a relatively 'raw' unprocessed state while others were extensively manipulated. Overall, *I feel myself looked at by the things* shows the initial contact between the two worlds and suggests how this might lead to being visited by forms from the other place.

In the second section of the video the occupant of the *other* space is *Bellmer*, after Hans Bellmer (fig. 34). This form is reflected in the real space of the installation in the shape of 3D printed drawer handles for the dressing table (fig. 35).



fig. 34 Bellmer, H (1936) *The Doll*. Painted aluminium on brass base. 635 x 307 x 305

Bellmer is a bilaterally symmetrical form with a cylindrical central body and three 'limbs' or 'fingers' at either end. In keeping with the experience that there is something uncanny about forms that sit indeterminately between biomorphic or geometric form, *Bellmer* has a precise

geometrical layout that can be measured and drawn using only compasses and a straight edge (see figs. 43-49)

The movement of *Bellmer* is intended to be something like an underwater creature in strong currents but also perhaps a small bird that might land on a windowsill. The animation of this section, showing *Bellmer* floating and swimming in the space behind the screen, references traditional qualities of character animation and, to a greater extent than has been the case in the previous work, has a sense of personality and appeal as well as agency. This brings out a certain humour and delight in the movement of the character that is reinforced by its deliberate formal reference to wall-walker children's toys, tree frogs and its reference to the movement of small animals. The animation in this section contrasts with the more automatous, dynamically driven movement in the first and especially the third section of the video, which is much less clearly alive. This central section is arguably less uncanny than the others but explores a more surreal, absurd territory. This is both a departure and a development of the animation in the practice.

I feel myself looked at by the things: production and installation



Fig. 35 I feel myself looked at by the things. 3D printed handle



Fig. 36 I feel myself looked at by the things.



Fig. 37 I feel myself looked at by the things



Fig. 38 *I feel myself looked at by the things*. installation view



Fig. 39 *I feel myself looked at by the things*. installation view

In selecting a dressing table as the focus of the installation I was thinking of it as a domestic object with feminine and maternal associations. The dressing table is homely, old fashioned, private and personal. One consideration is that it may have different associations depending on the gender identification of the audience. The type with triple mirrors, designed to allow the user to see themselves from multiple angles, is often one's first childhood encounter with the mysterious, apparently infinite space behind mirrors and their recursive reflections. The drawers in a dressing table are likely to contain personal items of great personal significance as well as a clutter of items for personal grooming. This work also takes advantage of the arrangement of three mirrors being visually reminiscent of an altarpiece or painted triptych. In structure this also gives the potential for the mirrors to form the primary focus of the piece while allowing other elements to be included in a supplementary way, for example the content of the drawers – these can be the equivalent of the predella of an altarpiece. A mirror,

according to superstition, is the site of magic and to psychoanalysis it is where the infant experiences the traumatic identification with and alienation from her own identity. This psychic charge from antiquated beliefs and the disturbing challenge of one's own chiral image makes the mirror suitable as an uncanny mediator between the installation space and the screen space of the moving imagery.

The table used has been salvaged from a house renovation. It had been decorated with black paint and layers of magazines and newsprint in the style known as 'shabby chic' or upcycling. At some point subsequent to this project the owner disposed of the table and left it outside, exposed to the elements. The effects of light and moisture mean that the surface decoration of the table flaked and softened as the wood underneath swelled and distorted. The final quality of the table, with lifting veneer, splitting joints and distressed surface inspired the moniker 'Scabby Chic'. In this respect, the homely associations of the furniture are disrupted by its decrepit appearance.

An important development here is that this work is less rigidly site-specific than the previous installations. To clarify; the video will be site specific to the piece of furniture and the furniture to the video but the installation does not relate to the exhibition/gallery environment in the same way as the previous work. The requirement of the environment is to be dark with controllable lighting. This means that the work is more flexible in its location, placement and installation but still plays with the relationship between virtual imagery and tangible objects.

In the installation and subsequent evaluation of the work some issues arose worth noting here: The dressing table, although in a sense being site-specific to itself, has lost some of the impact of the previous works through their direct relationship to the exhibition environment. In future, the background plate for the final section of the film showing the dressing table will be filmed in the exhibition environment, with the table in place. This would take around a week to set up for each exhibition location and would require access to the space in advance, but would add another level within the *mise en abyme* of the installation. The timing of the playback of the

video as the viewer enters the space and sits at the dressing table is another variable that needs to be controlled. In future the playback will be actuated by pressure pads, in order that the screens stay dark and the mirrors reflective until the viewer sits down. The background in the first section of the video needs to be developed in order to more closely relate to the visual qualities of the dressing table itself, as this was not apparent to some visitors.

To summarise, the practice has progressively taken on layers of uncanny signification, taking Freud's insight into the ultimately familiar quality of uncanny experience as key but also exploiting a variety of other uncanny tropes and signifiers. At the same time, the presentation of the work as installation art, outside of a conventional narrative framework and in a gallery situation at once undermines its plausibility and reinforces its uncanny qualities. In foregoing the most recent technological developments, such as virtual and augmented reality, I have endeavoured to focus on the more established and ubiquitous, yet still current technologies of CGI visual effects, which are even more widespread in the post-cinematic period. The use of unremarkable environments in the videos has reinforced the sense of familiarity while the form, visual surface qualities and movement through animation (a practice itself closely associated with the uncanny) all serve to increase a perception of indeterminacy - between organic and mechanical, living or lifeless, present or absent - and vague familiarity. The implications that the characters are visitors to these spaces from another place draws attention to their other, artificial quality. The effort, in the convention of the visual effects shot, to simulate perceptual plausibility or "photorealism" conflicts with the installations efforts to debunk itself. This tension leads to a kind of cognitive dissonance as the viewer's perceptual system recognises the object within the shot as having some of the necessary qualities to appear real but is also met with indications that the situation is suspect. In the latest practice, the current easy availability of 3D printing means that the virtual characters in the practice have another means of entry into the space we occupy. (figs. 53-58)

Animism, attributing life and spirit to inanimate things, is used throughout. Some of the objects appear to be made of materials that should not be alive and should not move but in a broader

sense, our ability to perceive agency in shifting areas of computer generated pixels on a screen reinforces the idea that these animist beliefs persist in our relation to the world and to images, and animated images in particular.

The Jentschian conception of the uncanny as a kind of ontological psychical uncertainty or indeterminacy is exploited extensively in the practice, for example in the qualities of movement, form and surface and the way the installations lead the audience to view the immediate environment and the screen-based materials as suspect. This defamiliarisation, as a strategy in artistic practice, can be effective in provoking a reappraisal of the audience's relation to material presented. The qualities of uncanny experience, not as an emotion but an embodied affect point to possibilities beyond a psychoanalytic framework of interpretation.

The post-cinematic uncanny is expressed in this practice at a particular moment in visual culture, where audiences have become acclimatised to moving images that are digitally captured or generated, composited and graded. This ontological montage of competing realities (Manovich, 2001) has become banal and is absorbed with a kind of casual acceptance or unthinking indifference by global audiences, in stark contrast with the wonder and suspicion expressed in the 1990s towards this seemingly magical technology. The potential for a momentary 'shock of recognition' of the 'magical operations' (Gunning, 2003) of these established visual technologies has begun to be realised in this practice. The mediator here is the phenomenon of the uncanny, experienced as an uncanny shudder (Gunning, 2008:69) at the recognition of an illusion that is absorbed and accepted before and after it is recognised.

CHAPTER THREE: CONCLUSIONS

Affect theory provides intriguing and revealing ways of thinking the uncanny, animation and visual effects in this post-cinematic period. This practice makes new ways of knowing and experiencing the uncanny.

Gunning's 're-newing' of established technologies (2003), mediated through the phenomenon of the uncanny, works to explain why these pervasive and mature visual effects processes have been amenable to re-examination and remediation in this research. In this way the artwork performs an excavation of peculiar, uncanny wonder in something that has become habitual and automatised. The visual source of this practice stands in contrast to (or somewhere between) the avant-garde of media arts, which often rely on 'neo-baroque' novelty, spectacle and technological virtuosity (Ndalianis, 2005) and the temporally distant unfamiliarity of media-archaeological practices. The post-cinematic visual effects described in this thesis and employed in the practice are at a moment of cultural habituation, being neither new, antique, nor media-archaeological. Audiences consider themselves to be aware of them but are uninterested in the means of their production and paradoxically become increasingly oblivious to their existence. This moment in the cycle of novelty and habituation interests me as a practitioner – allowing the exploration of CGI, visual effects and our relationship to 21st century moving imagery.

Freud's ideas on the uncanny are compelling and insightful, yet for me are incomplete and insufficient. Freud's essay is oddly defensive, given that he begins by establishing that he is treading on near-virgin territory in aesthetics. The text seems increasingly defined by its lacunae and use (overuse) of lists and typologies. Notably absent in Freud's analysis is an examination of pleasure in the uncanny. Given the range of examples given of the uncanny in art, it is striking that he provides us with so little suggestion of why we would choose to expose ourselves to such a troubling phenomenon - or of the difference between the uncanny in art

and literature and the experience in real life. One gets the feeling that any attempt to define and pin down the uncanny is necessarily secondary to the intensity of the experience itself. I would suggest that the uncanny is slippery, a resistant surplus to understanding, oozing like oil from unexpected places (Manauagh, 2015).

Viewing the uncanny through the lens of affect theory, as an embodied preconscious and prepersonal intensity, the 'uncanny shudder' (Gunning, 2008:69), that traverses, but is not limited to, our bodies and that we 'fix in post' as horrible, pleasurable or somehow *both of these things at once* might help to explain uncanny pleasure in art. The practice presented in this thesis has 're-newed' and isolated a particular form of uncanny experience that is already held within contemporary CGI. While it so far avoids the territory of outright horror, it does have, along with its uncanny qualities, a certain kind of absurd humour and aesthetic pleasure. It does engender an 'uncanny shudder', physical reaction, involuntary exclamation and gesticulation. The source of this 'uncanny shudder' flows through the same stream as laughter - It is virtual '...a lived paradox where what are normally opposites coexist, coalesce, and connect.' (Masumi, 2002:30)

The research practice reflects and recontextualises CGI and visual effects in contemporary moving imagery. It explores their relation to our lived space and the movement between these dimensions of experience. The practice has expressed its answer to the research questions through a series of 'metapictures' (Mitchell, 2006). In using CGI visual effects to comment upon CGI visual effects, my work 'reflects on, or "doubles" itself' (2006) in a kind of recursive movement or ontological *mise en abyme*, leaving the viewer dislocated from reality.

The final piece presented in this thesis, *I Feel Myself Looked at by the Things* (figs. 30-33) takes this transdimensional, metapictorial quality to new levels of intensity. Through the use of two-way mirrors that alternate between reflecting the viewer and displaying virtual, real and hybrid spaces and 3D printed doubles of virtual objects that also appear in moving images on screen,

attached to an image of a real object, a disruptive and vertiginous movement is generated between normally separate conceptual spaces.

The urge in contemporary visual effects practice towards the 'paradox of perceptual realism' (Rodowick, 2007:101) leads to the creation of imagery that is atemporal, in the sense that it may depict events that never occurred, to objects that never existed, in locations that have been augmented, being given all the surface cues of reflectance, rootedness and solidity that lead us to a sense of immediacy and 'realism'. In this respect, CGI visual effects images are like Freud's uncanny double (1919), but a double for which, paradoxically (and uncannily), there is no original referent. This practice exploits the conventions of film and installation art in order to recover 'something of the original strangeness' (Gunning, 2003:45) of computer generated imagery. In using the magical operations of visual effects technology it reflects something of our relationship to technology, post-cinematic digital moving imagery and the nature of the uncanny in art.

Appendix 1

Overview of the production process

The working process is broadly as follows: The location is scouted and recorded. I tend to avoid locations that are conventional 'white cube' gallery spaces for technical and aesthetic reasons. Exhibition spaces often lack high contrast feature on the walls and floor that are a technical necessity for 3D tracking. The animated forms I have made tend to cluster in dusty, inconspicuous places, mimicking features of the architecture around them - they would be more likely to be found under a stairwell or in a corner than in the centre of a gallery. At this stage the camerawork has to be done while keeping the eventual outcome in mind, so there is often a focus on 'empty' areas in the frame where CGI elements can be added later (fig.20). It is essential that the shot has sufficient localised areas of high contrast to allow tracking. These areas must fall on different planes and at different distances from the camera in order for the software to calculate the nature of the space using the relative movement of the tracked points (parallax). In the case of environments without high contrast features these can be added using tracking markers, stickers or careful set dressing (such as placing litter on the floor). The peculiar ways of looking at, moving within and thinking about a location that are needed to visualise, film and produce visual effects shots creates in me a unique engagement with the spaces I work in. I find I am at once highly engaged with what might seem to be many incidental details and yet consciously creating a focal void within the shot that can be occupied later. The camera used was selected because of its charge-coupled device (CCD) sensors. With CCD, all the pixels of each frame are captured in a single instant, compared to complementary metal-oxide semiconductor (CMOS) sensor based cameras, which have a 'rolling shutter', where the frame is captured progressively from the top of the frame down to the bottom. When CMOS sensors record fast camera moves or fast moving objects, the object can change position during the process of capturing the frame, leading to shearing and distortion. This type of distortion can make the process of 3D tracking either less accurate or impossible (*Rolling Shutter*, n.d.). All features to stabilise the shot in the camera have been disabled in order to make tracking more accurate. A balance has to be struck between using a low shutter speed, which gives smoother

movement with more cinematic motion blur but which, because of that blur, can be impossible to accurately track and a higher shutter speed, where each frame is sharper and easier to track but can lead to a strobing, stuttering effect in the footage. For these reasons it is difficult to judge whether a given shot will be 'trackable', so a range of shots, using different settings, patterns of movement and framing are recorded at each location.

In parallel to this process, the movement of a number of key areas of the video footage must be accurately tracked in two dimensions throughout the shot. It is possible to allow the software to automatically select a large number of track points on the footage, track the footage, filter the trackers for accuracy and create a 3D solution from this information. For these artworks, it was found that manually tracking a smaller number of carefully selected points through the shot was more accurate and effective, albeit far more time consuming. The process of manual tracking means that each point must be monitored through the shot, brought back on track if it wanders off in error and nursed frame-by-frame through especially blurry or problematic parts of the shot.

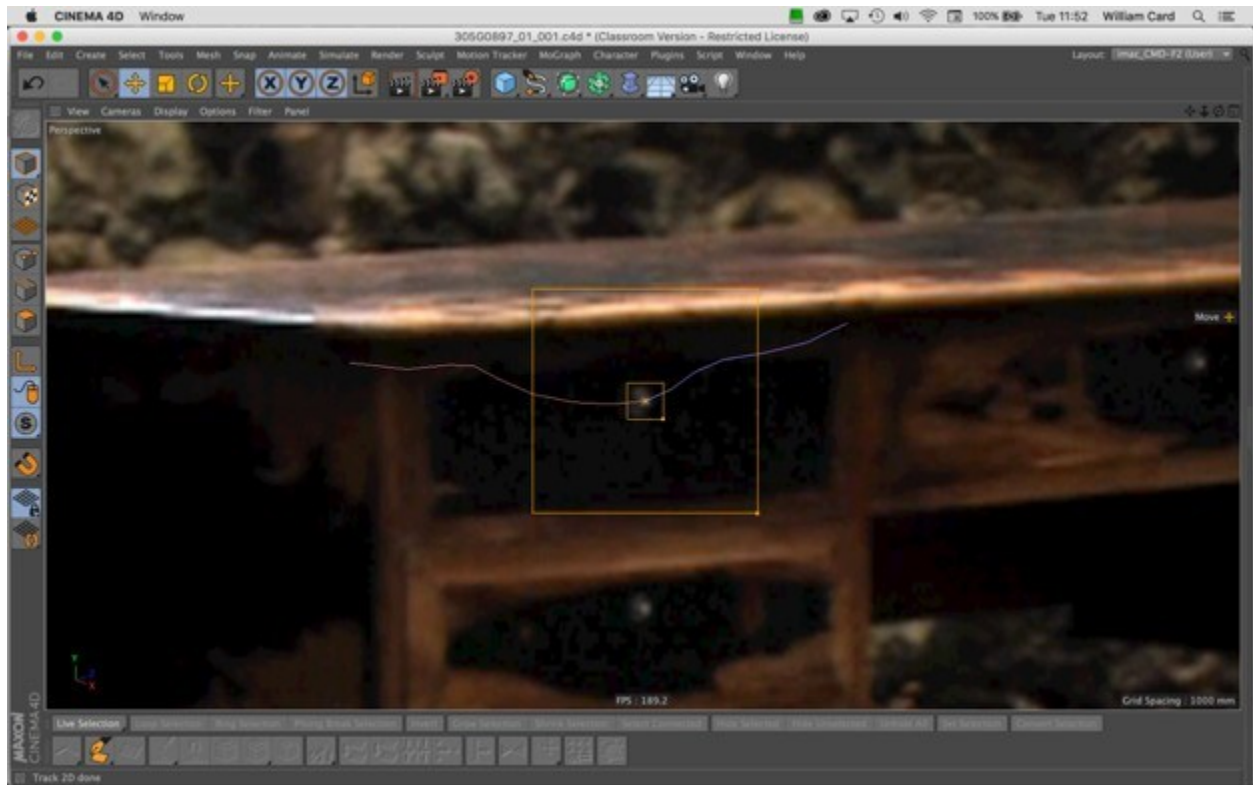


fig. 40 2D track of a feature in a video sequence

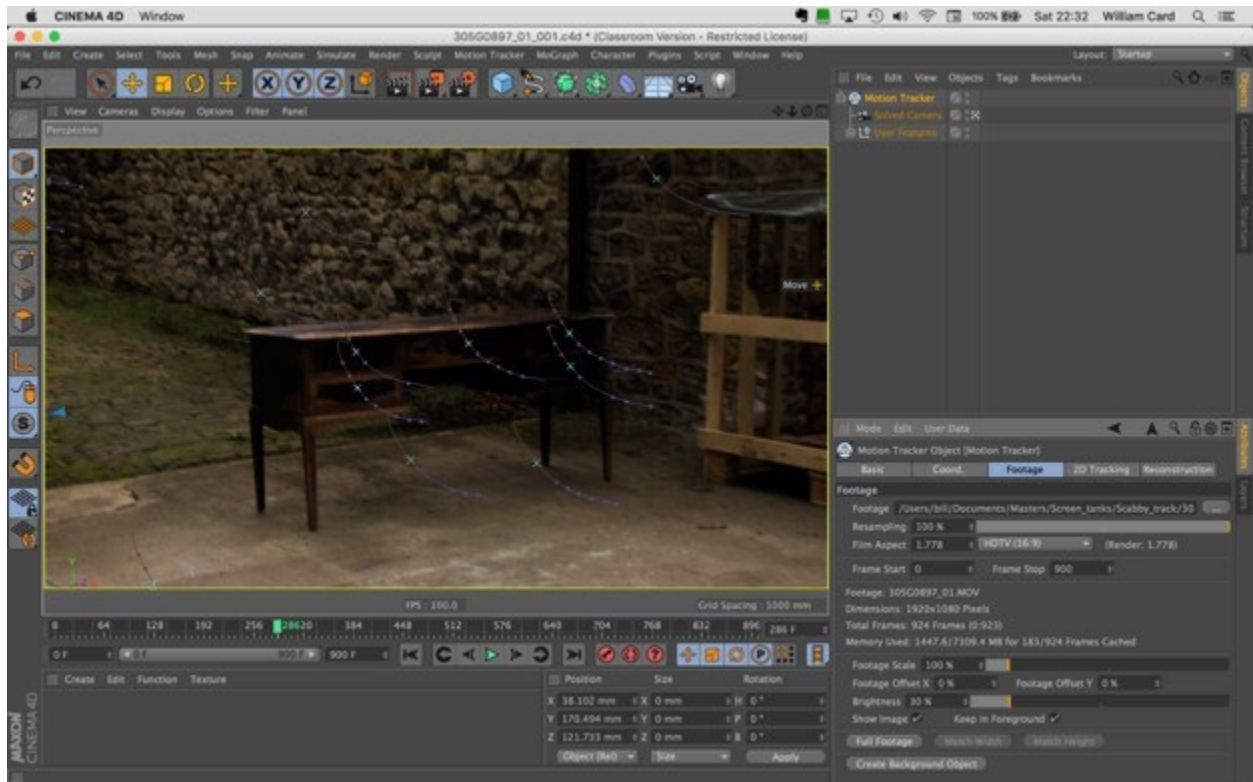


Fig. 41 multiple 2D trackers

Once this is done the software *should* (but is not always able to) be able to use the relative movements of the tracked video to reconstruct the recorded space in three dimensions along with a virtual camera that matches the movement of the real camera that was used to record the original footage (fig. 41). The virtual 'visitor' to the scene can now be imported, placed and animated. The animated elements are then rendered separately from the background video in layers or 'passes', each containing a different element of the render (for example shadows, diffuse colour and reflection). These passes are then layered back onto the video using compositing software. At this stage the colour correction and matching of blur and grain between the elements can be done. The final sound can now be recorded and mixed for the shot.

Once the shot is selected a visual development process leads to the production of polygonal three-dimensional virtual models of the intended forms, a process analogous to sculpture. An

armature of joints is then created and bound to the polygonal mesh (weighting, fig.47) and an interface to support the manipulation and animation of the joint skeleton is produced. The initial surface qualities of the 3D object, such as colour, pattern, reflectance, roughness and transparency can be specified and mapped to the geometry at this stage.

Appendix 2

I feel myself looked at by the things (production)

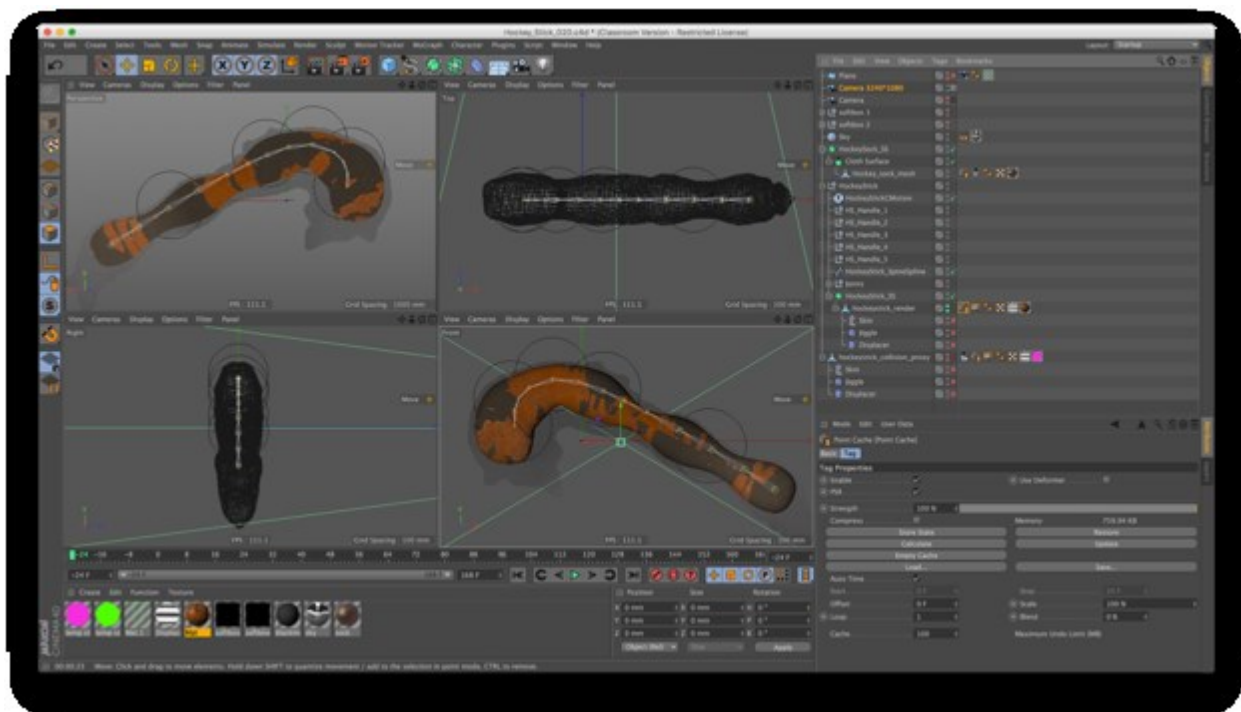


Fig. 42 Development of Hockeystick animation

The hockeystick is a relatively simple form, like a hockey stick or bent sausage. The inner form is moved by a joint chain set up with a spline inverse kinematics (IK) controller while an animated texture deforms the surface in a motion similar to peristalsis. The animation controllers are driven by repeating motions that are out of phase with one another, creating movement that seems natural but repetitive. The sac surrounding the inner form is a larger version of that inner form that has been caused to ripple and crease in response to contact with the inner form. This

has been achieved using a dynamic cloth simulation. Because of the nature of dynamic simulations, where the initial conditions, forces and material properties are determined by the artist but the actual movements of the cloth surface are then calculated by the software, this took a significant amount of time and many attempts until the movement was satisfactory and the cloth did not pass through the surface it was meant to be colliding with.

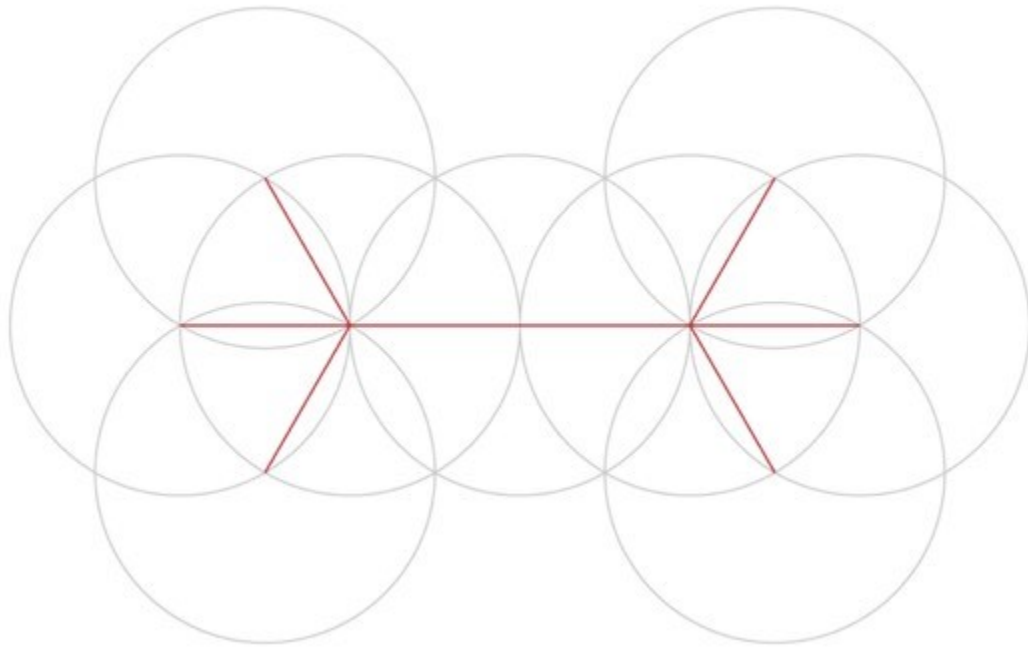


Fig. 43 vector drawing showing the geometrical body plan for Bellmer.

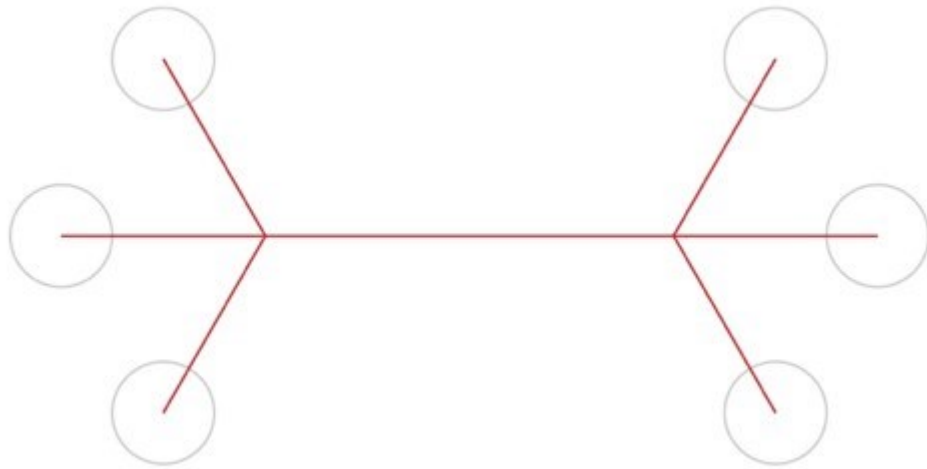


Fig. 44. vector drawing showing 'skeleton' of *Bellmer*

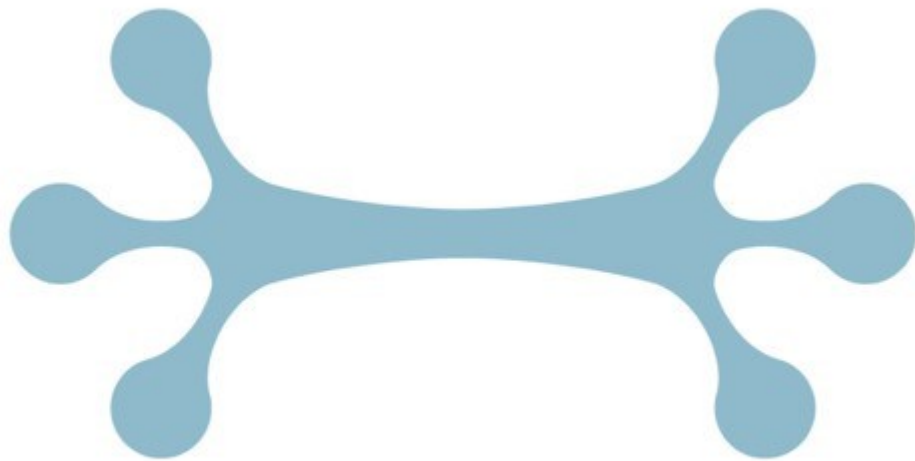


Fig. 45. Vector drawing showing the curvilinear overlay of the form of *Bellmer* over the geometrical 'skeleton'

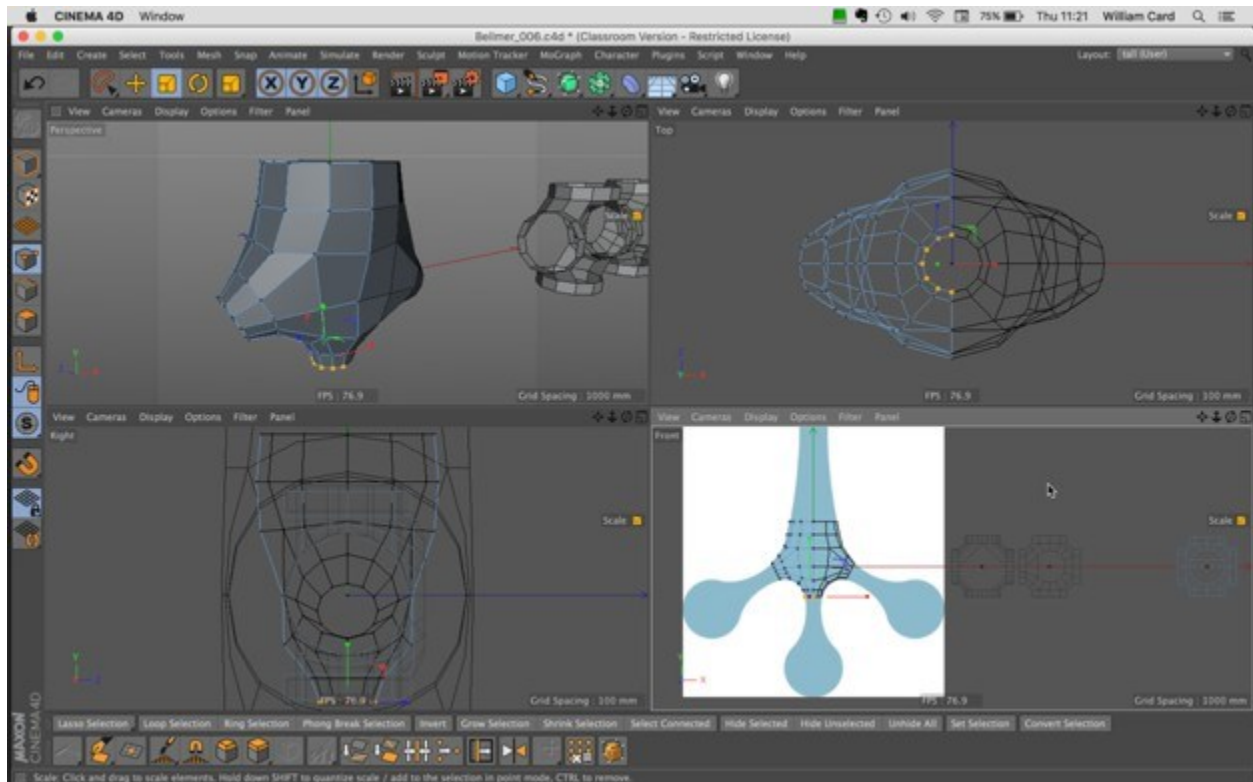


Fig. 46 3D modelling process from initial drawings

For the installation, The *Bellmer* character was designed to occupy the space behind the screen or mirror in the installation. I also wanted the form to appear to stick to the rear surface of the screen/mirror. In this I was thinking of window walker toys, tree frog's toes and slugs. The model had to be designed in such a way that it would deform in response to the pressure on the glass and discolour, similarly to how one's finger whitens when pressed against glass. This was achieved with collision deformer to flatten the mesh against proxy geometry that represents the screen/mirror and 'proximal', a shader that can change colour in reaction to the proximity of other objects.



Fig. 47 Bellmer (2016) Screenshot of work in progress showing joint hierarchy and vertex weighting.

The *Bellmer* character has been rigged with a joint structure and slider-based controllers that allow the main body and fingers to bend and flex independently.

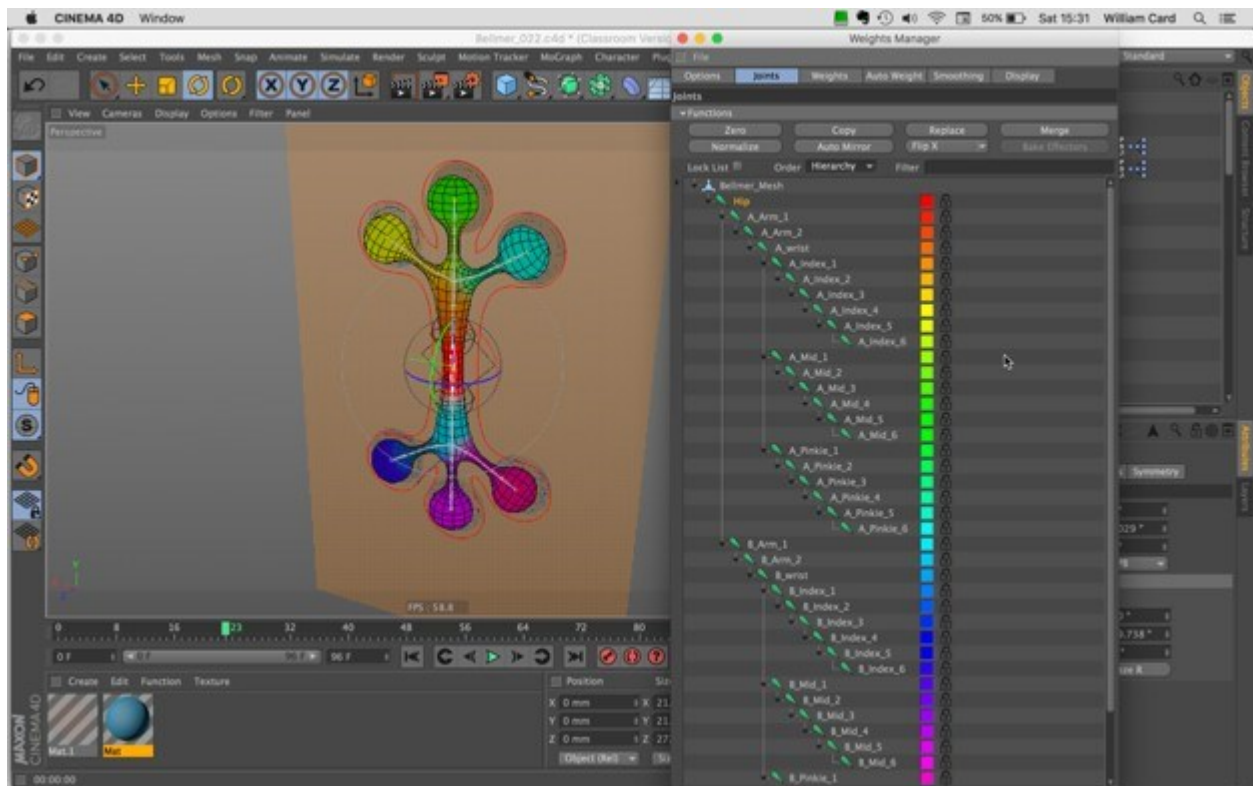


Fig. 48. *Bellmer* joint structure, joint weighting and rigging

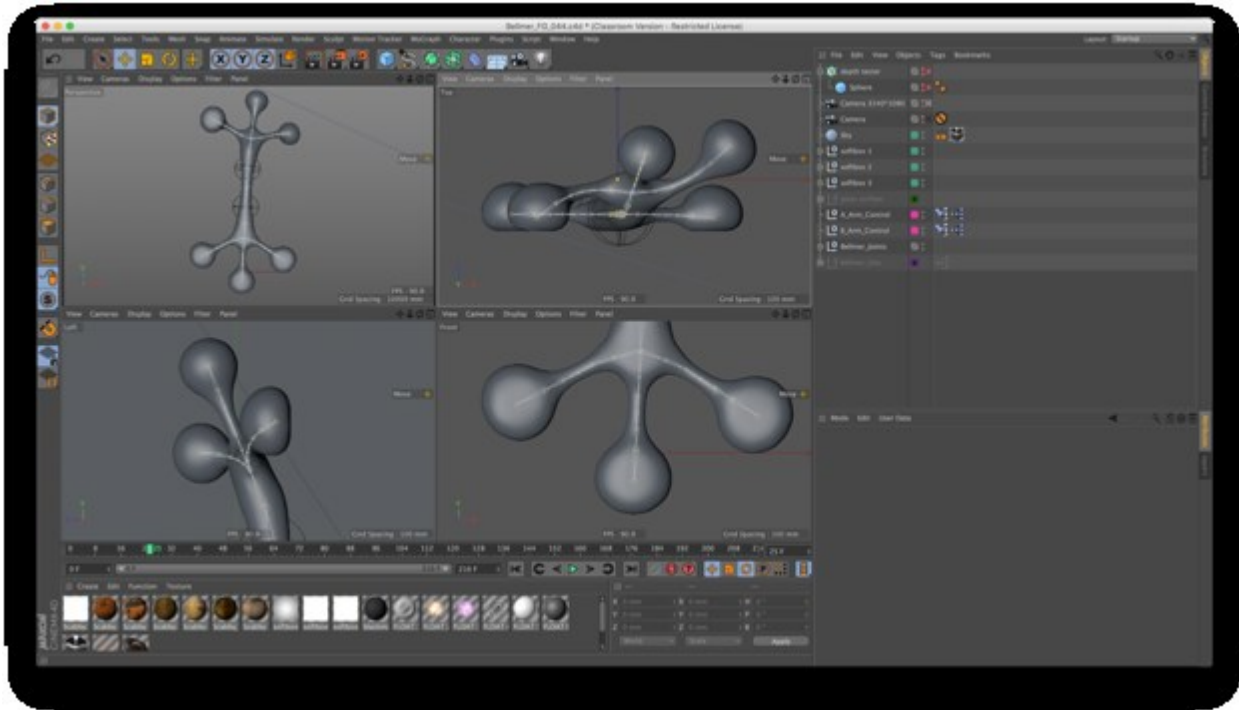


Fig. 49 Bellmer showing surface collision and deformation

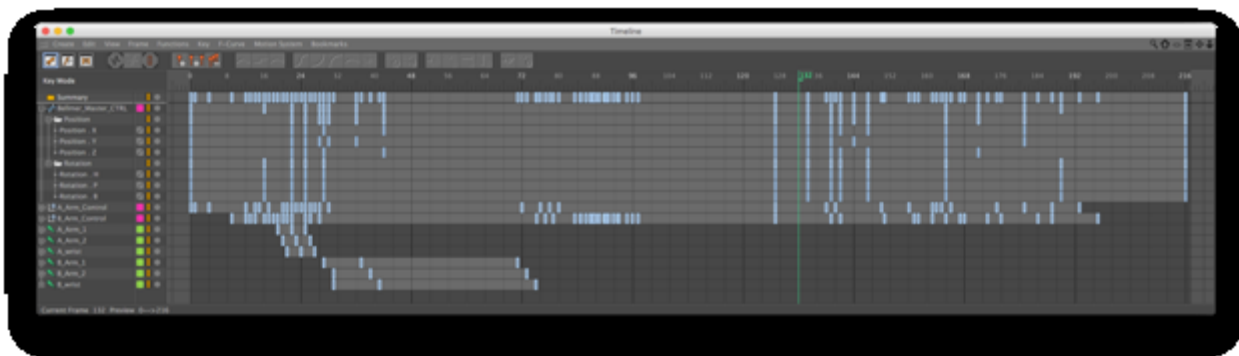


Fig. 50 Bellmer keyframes

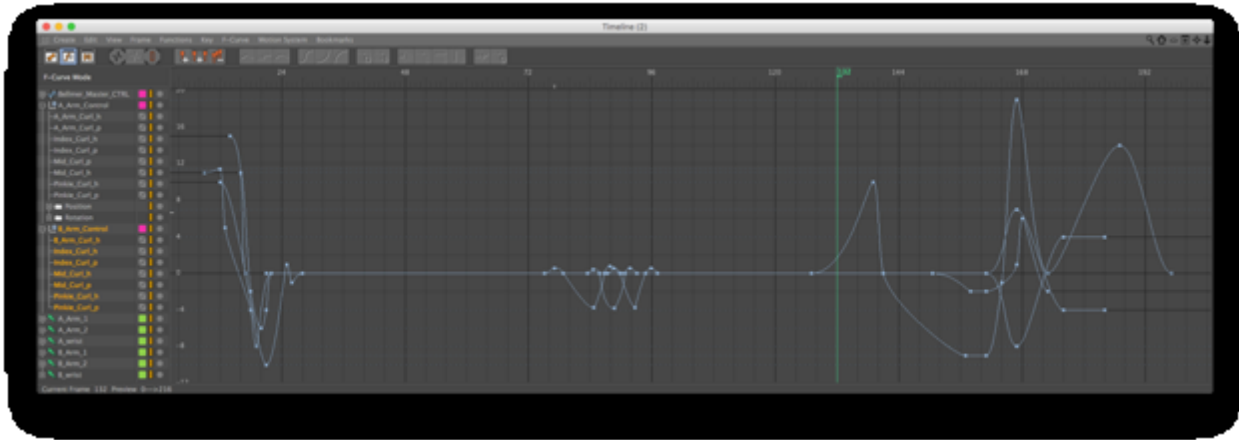


Fig. 51 Bellmer keyframe function curves

In the third section of *I feel myself looked at by the things*, 3D tracking technology is used to match CG objects to the scene as the camera moves. Features in the footage were manually tracked, frame-by-frame and the space and camera movement were reconstructed (solved) from this information. Customised versions of the Bellmer model were adapted and rigged to form the drawer ‘handles’. The animation of the central handle was created by a dynamic simulation applied to its joint chain. Three black cuboids were made to match the scale and proportions of the ‘mirrors’ added to the real dressing table. At the compositing stage, fake ‘shadows’ were tracked to the footage to give the impression that the ‘mirrors’ were darkening the table top.



Fig. 52: Screenshot showing tracking of animated 3D models to video footage

I sampled and purchased Pilkington ‘MirroView’ glass for the displays. This product is designed especially for placement in front of TV screens and digital signage. It works like a 2-way mirror and allows the content of the screen to show through the mirrored surface. Where the screen is dark however it has a reflective mirrored surface. MirroView is available in two versions, ‘standard’ and ‘50:50’. The ‘50:50’ version, which I am using, is designed for higher ambient light conditions and is less reflective. This seems to give a clearer view of the content on the screen and, with careful control of the lighting conditions, can still give a clear and reasonably bright reflection of the viewer and their surrounding environment. This means that in planning and editing the sequences together I have to consider that dark areas of the screen and black ‘slugs’ between clips will actually show the viewer’s reflection and environment.

I designed and specified 3D-printed drawer handles to replace the original handles for the dressing table. These take the form of one half of the Bellmer character. There is a hole in the base sized to accept a threaded insert, which allows it to be screwed to the drawer fronts. This

means that the Bellmer form is shown in the 'Residents' own space, as a virtual addition to a video of the dressing table itself and as a tangible, physical addition to the table as encountered by the audience. The 3D printing process has been fascinating; this is the first time I have been able to literally bring a form from the other side of the screen into my hands. The impact of seeing impossible animated forms on screen that are doubled as real objects in space marks an important development in the practice. This has occurred relatively late in the process and clearly justifies further reflection, experimentation and exploration of its potential as the practice moves forward.

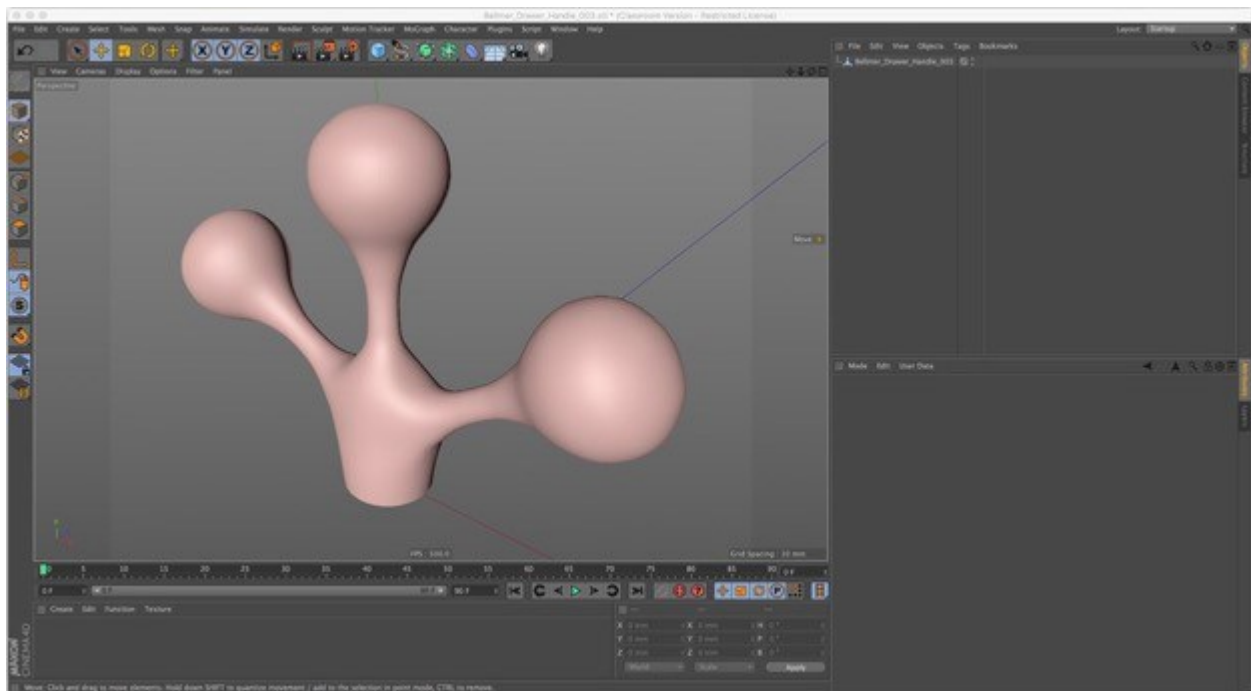


Fig. 53: Screenshot showing model of drawer handle prepared for 3D printing

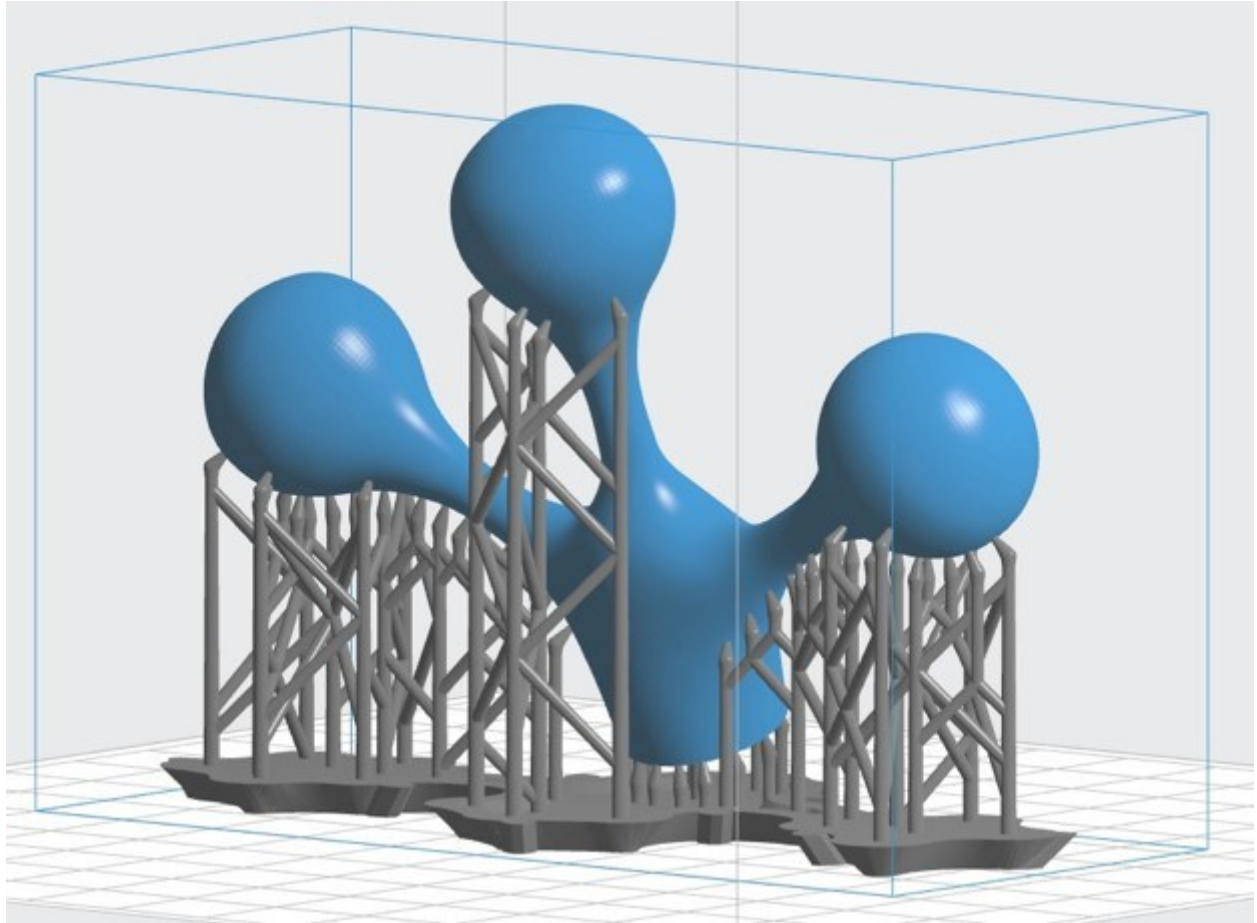


Fig. 54 CAD model showing support structures prepared for printing



Fig. 55 parts before IPA rinse and UV curing

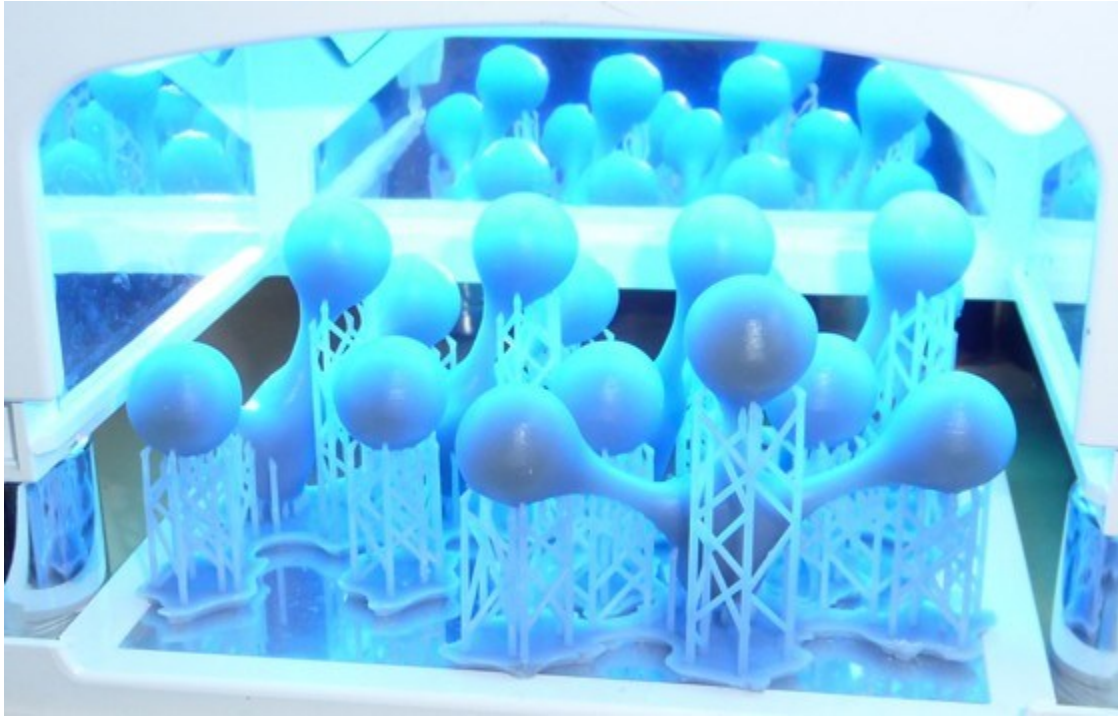


Fig. 56 UV curing of resin parts



Fig. 57 Cured part ready for trimming, filing and sanding

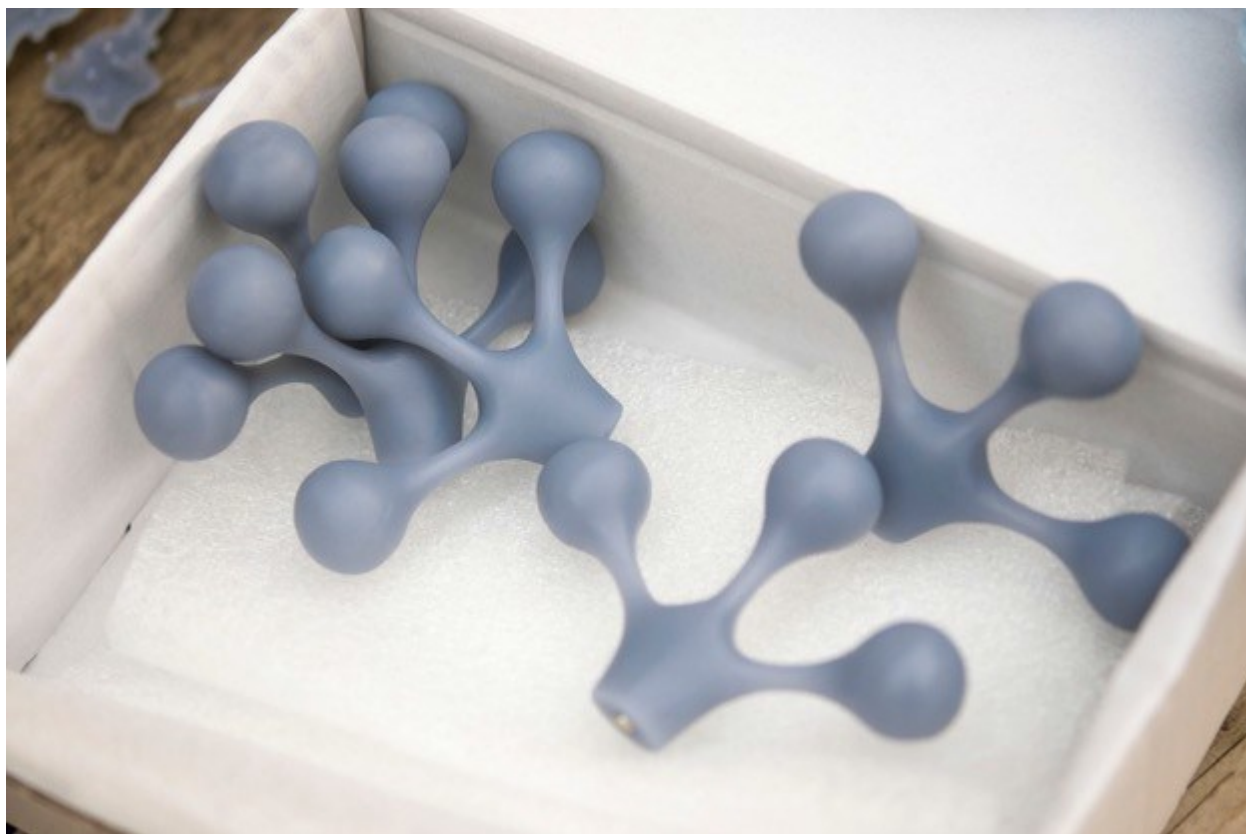


Fig 58. Finished parts complete with threaded inserts

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